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Survival mechanisms for food security: household strategies and nutritional well-being in rural South Africa

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Survival mechanisms for food security:

Household strategies and nutritional well-being in rural South Africa

by

Rebecca Farma Catalla

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has met the dissertation requirements of Iowa State University

Signature was redacted for privacy.

Major Professor

Signature was redacted for privacy.

For the Major Program

Signature was redacted for privacy.

For the Graduate College

In memory of my parents and my sister, Christina

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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ABSTRACT

Extant knowledge on South Africa reflects a distinct lacuna in analyses of households' livelihood mechanisms for food security and nutritional well-being. This research has been undertaken to help build a knowledge base concerning the country's rural communities and the much lesser known area of levels of access to food.

The study draws upon the political economy perspective, particularly Sen's entitlement approach to food security, in examining causal influences to differential shortfalls in access to food. It also utilizes Giddens' structuration theory in investigating the interplay of household resources and prevailing social relations *vis-a-vis* the shaping of the unit's livelihood strategies. Against these theoretical orientations, the study advances a major hypothesis: households' food consumption patterns and child anthropometric status are determined by the direct and indirect effects of, and potential interactions among, household structure and characteristics, access-to-resources attributes, survival strategies, as well as income and expenditure patterns. Quantitative data on 4212 rural African households, drawn from a 1993 nationwide household baseline survey conducted by the Southern Africa Labour and Development Research Unit at the University of Cape Town, were used to analyze the hypothesized relationships. The multivariate estimation procedure employed was path analysis for directly observed variables of LISREL 7 in SPSS for Windows. Information from anthropological studies on rural South Africa is integrated in the interpretation of the results to unravel the underlying processes that the quantitative data analysis suggests.

Of the household characteristics and survival strategies examined in relation to the endogenous variables, household head's age and education, other adult members' education, and an employment-based livelihood mechanism show significant effects on household income and food expenditure patterns of both female- and male-headed households. These four characteristics also significantly impact, directly or indirectly through income and food expenditure, on daily caloric intake per adult equivalent, and on the natural logarithm of number of food items consumed. None of the household characteristics and survival strategies analyzed offer significant causal explanations on child weight-for-height and child

height-for-age nutritional status. Explanations for these results are advanced; other significant findings are discussed.

CHAPTER 1 – INTRODUCTION

Statement of the Problem

The specter of food shortages in Africa is widely known. In the recent past, visions of starving populations in the countries of Ethiopia and the Sudan, Algeria, Angola, Chad, Liberia, Mozambique, Somalia, Tunisia, and Zaire riveted global attention and raised questions about the phenomenon. The paradox in these images is that in many African countries, there exists a rich natural resource base and, thus, a large potential for food production. At the same time, there is an acknowledged sophisticated knowledge base on ecological management (Walker, 1995:148; Woodhouse, 1992:165; Campbell, 1990:143) among African farmers to offset the impact of recurrent food deficits. This context of prevailing contradictions has made Africa the focus of various analyses, especially concerning the environmental, economic, political, and social structural determinants of hunger, seasonality of lack of food, as well as coping mechanisms and strategies to ensure access to food.

Amid the initiatives to understand the dynamics of hunger and lack of food in the continent, a marked lacuna in studies on the food situation in South Africa surfaces. Two major interrelated factors appear to explain this observation: the deliberate exclusion of the country from similar endeavors because of its unique situation of sharp societal divisions and broad diversity (van Rensburg et al., undated:125), and an illusion of national well-being. The latter arises from the fact that South Africa is the region's major food exporter (Mukonoweshuro, 1991:175; Marcus, 1989: 21-22; Wilson and Ramphele, 1989:100), the myth advanced by the country's apartheid-era government that "black standards of living are higher than in other parts of Africa" (Bryant, 1988:4), and the dominant role that the South African government has exercised over the economies of the other countries in the region (Thompson, 1991:17-25; Bryant, 1988:5-7).

A review of extant literature on the country reveals conditions of deprivation not unlike those in most of Africa and other developing nations, yet also unlike them because of its experience with apartheid. In 1980, approximately 50 percent of the total population was

said to have been living at below subsistence levels, the corresponding figure for the total African population having been 60.5 percent (Wilson and Ramphele, 1989:17). No less than 81 percent of the households in the reserves (the African rural settlements) lived in grinding poverty (Wilson and Ramphele, 1989:17-21). Widespread hunger and malnutrition were manifested in deaths of about 15,000 to 27,000 children under 5 years in 1975, while some 136,000 children under 15 years were less than 65 percent of expected weight for age by the beginning of the 1980s (Wilson and Ramphele, 1989:101).

Fairly recent observations on this issue of lack of access to food reflect a lack of change in the situation. A country analysis on the conditions of women and children between 1990 and 1993 led by the United Nations' Children's Fund (UNICEF, 1993: 4, 7) noted that half of the total population lacked the means of providing adequate food for their families (UNICEF, 1993:7). The affected groups were mostly Africans and Coloreds, those living in rural areas, poor urban communities and informal settlements (UNICEF, 1993:4). Approximately 2.3 million of the country's population needed nutritional assistance and of this total, 35.9 percent were children age 6 months to 12 years, 55.8 percent were 6 to 12 year old children, and 8.3 percent were pregnant and lactating women (UNICEF, 1993:4). Malnutrition rates were said to have been caused by a lack in food consumption and in household food security (UNICEF, 1993:4).

Given these brief glimpses into the poverty and hunger situation in South Africa, a systematic assessment of the problem of lack of access to food is clearly needed. In particular, a sociological investigation on how South African households have struggled to ensure food availability and how their coping or survival strategies contribute to their well-being can reveal the implicit social processes that unfold at the micro level. It can also identify the population sub-groups that have had to devise workable ways in order to survive, and demonstrate the differential impact of said mechanisms or strategies on the health and nutritional condition of the households.

Research Issues

"If you have to buy food in the market there is never enough – there is always hunger (Ghanaian farmer as quoted in Devereux, 1993:54)

Lack of access to food, or food insecurity, has been said to exist whenever the availability of nutritionally adequate foods is limited or uncertain (Campbell, 1991:106-107). For most of the developing countries' disadvantaged population groups, food security is being able to eat at subsistence levels – through a meal each day or every two days – or of simply having food for children or for those who can economically contribute to the survival of the household (Leonard, 1991:1127; Thomas and Leatherman, 1990:106-107). This reality is frequently a consequence of poor households' inability to produce or acquire sufficient amounts of food.

At the heart of lack of access to food as a social problem is the relationship of people –or of particular groups of people – to food, not the absolute existence of food per se (Griffin, 1987: 21). Frequently, this relationship is defined by the resources that they can control, or at least access (e.g., land, tools and equipment, farm animals), in order to produce food and/or products that will provide income to buy food. Access to resources, however, can be circumscribed by race and gender such that persons of color and women find themselves at a disadvantage in a society where skin color matters and gender inequality prevails.

Another key determinant of one's relationship to food is the availability of labor that can be sold or exchanged for cash-earning and food purchasing purposes. The sale or exchange of labor can occur in farm and off-farm settings in rural areas, as well as in urban areas particularly by the male members of households. Often, the sale of labor is on a temporary or casual basis at fixed low wages and constitutes at least a supplementary source of income, if not the principal source. Because earnings derived from wage labor activities have been generally insufficient to meet food and other basic needs of the households, women have also increasingly incorporated themselves into this survival strategy. Their occupations are usually limited to unskilled work (e.g., sewing, cleaning, and machine-

operating), low-skilled retail or manufacturing jobs, low-paid domestic or farm labor, or low-earning informal activities such as food preparation and hawking (Seidman, 1993:295, 299).

A third defining element of a person's relationship to food, albeit an uncommon option in most Third World countries, is the availability of governmental and/or non-governmental food programs to alleviate the lack-of-food conditions among the poorer groups of a society. Such initiatives have come in the form of food-for-work programs, food stamps or food-voucher programs, or public food distribution programs (e.g., school feeding activities, soup or community kitchens) that most frequently are urban-based. These schemes are generally only supplementary forms of assistance and are not meant officially to be the beneficiaries' only source of food. Hence, it is still necessary for said beneficiaries to obtain food through use of productive resources and/or sale of labor, when possible.

An individual's relationship to food may also be defined by an array of activities that (s)he will employ. These activities include reducing the household size (i.e., through temporary fostering of children or out-migration of household members), changing dietary and consumption patterns (i.e., reducing the number of meals per day or going without food, food rationing, or diluting cheap processed foods), or drawing upon the more traditional redistributive processes of inter-household food or labor exchange (Muthwa, 1994:171; Swift, 1993: 5; Thomas and Leatherman, 1990:107). The decision to employ one or any combination of these activities is often dictated by a person's stage of destitution and by the exhaustion of limited options that characterize poor individuals and households (Corbett, 1988:1106-1108).

Depending on how each element, or a combination of them is effectively harnessed in strategies towards food acquisition, households or groups will have differential access to food for their immediate consumption. The quantity and quality of their food, however, raises another concern. People who have few or no productive resources or rely solely on employment income are further constrained by food prices and, as such, may be restricted in the types of food that they eat. In such cases, meeting the minimum requirements for physical work and survival are indicators of adequate food.

The implication of this self-determined minimum food requirement for disadvantaged groups – in an environment of structural constraints – is malnutrition. Lack of variety in food intake as well as inadequate quantities of food consumed have been shown to result in undernutrition and/or nutritional deficiencies which, in turn, impact on the physical working capacity of an individual, a household, or a group (Payne, 1994:83; Leonard et al., 1994; Hodgson et al., 1994; Krebs-Smith et al., 1987; FAO, 1985:35). Furthermore, nutritionally deficient individuals become vulnerable to diseases while children, in addition to their susceptibility to infections, experience distortions in their growth patterns (FAO, 1985:23).

Investigating these issues is critical if the dynamics of the food accession activities among the poor are to be understood. It is also crucial if appropriate and effective policies and grassroots solutions are to address this central issue of lack of access to food.

Questions to be Addressed

Three major questions provide the direction for this research: What are the food security strategies of rural African households? How do these households differ in their strategies to be food secure? Under what conditions are they able to attain food security and nutritional well-being?

These broad questions subsume specific concerns. In addressing the first question for instance, the study also proposes to answer the following: Who are the food insecure among rural Africans in South Africa? What are their distinguishing characteristics? How have these characteristics shaped their responses or strategies for food security?

Analyzing the differences among rural African households will build on these areas: What unique opportunities and constraints will the households have in their food accession strategies, income levels, food consumption patterns and nutritional status? What common patterns will they exhibit?

Finally, the response to the third research question will be based on the information generated from these points: Do specific household characteristics (i.e., household structure and socioeconomic attributes) and survival strategies influence caloric intake, dietary diversity, and children's nutritional status? What factors differentiate households' access to

adequate diets and adequate child nutritional levels? To what extent do income levels and household expenditures mediate food consumption patterns, as well as child nutritional status? In what ways does household headship impact on the food accession strategies, incomes, food consumption patterns and child nutritional levels in rural African households?

Goals and Objectives

The overriding goal of this research is to provide a sociological contribution to the existing body of knowledge on the dynamics of household food security as well as to offer insights on this concern based on the unique conditions of rural South Africa. The specific objectives of the study are as follows:

1. To describe the range of income-earning and labor-allocation strategies that households employ to attain food security and nutritional well-being;
2. To describe the nutritional status of rural African households;
3. To evaluate the differential effects of household structure and socioeconomic characteristics on households' livelihood strategies, income and food expenditures, and the nutritional status of household members;
4. To assess the interaction of household characteristics and survival strategies in influencing the nutritional status of households;
5. To identify and explore the factors associated with income and expenditure patterns of households regarding nutrition.

Methods and Data

This research utilizes a nationwide poverty survey data set which was collected in September 1993 under the auspices of the Southern Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town. A sample size of approximately 9,000 households was interviewed using a comprehensive household questionnaire which was formulated in collaboration with social scientists from universities and other research

organizations in South Africa. Actual data collection was made possible by the participation of five professional survey organizations in the country (SALDRU, 1994).

The data obtained from the survey are largely quantitative and covers a range of areas in an effort to establish country baseline household statistics. This study will focus on specific sets of information. These include data on household structure and characteristics, access to and use of land resources, agricultural production, employment and income-earning activities, household income, income sources and income levels, food spending and consumption, household expenditures, and anthropometric information on children age two to six years.

The principal unit of analysis of this study is the household. However, individual-level analysis is also undertaken especially in regards to employment, and child anthropometric status; prominent features will be aggregated to the household level.

Potential Scientific Importance

Access to food at the micro and macro levels of a society is a central issue of social change and development. It stands as a fundamental need, a basis of the organization of social life, and a requisite to stable and enduring social order (Hopkins, 1986:4). Food accession efforts of households and their impact on nutritional well-being provide insights into the breakdown of traditional social institutions, the emergence of new social patterns and, thus, the transformation of social structures and relations arising from the actions that various population sub-groups in both rural and urban areas have evolved in order to survive.

On a more concrete level, the study is of significance in a number of ways. Sociological analysis of the issue can help fill gaps in current formulations about food security, an area that has been the particular domain of economists, anthropologists and nutritionists. At the same time, this analysis can enkindle initiatives within the discipline to further explore the issue and its ramifications within and among households, and contribute to the growing interest in livelihood security as a pre-eminent issue.

The study also assumes importance for more traditional areas of sociological research. It has implications for the reconceptualization of poverty as viewed from the specific

dimension of food security. It likewise bears on the issues of agrarian reform, technological innovations, indigenous knowledge, and community action as key elements of social change and development in general, and as potential solutions for food security in particular. It holds importance as well, concerning women's increased participation in the labor force and for women's 'headship' of households as causes or consequences of lack of access to food and/or nutritional inadequacy.

Methodologically, the study makes a contribution towards validating an approach for measuring nutritional adequacy. This holds scientific significance given that the discipline opens itself to the various ways by which key aspects of social life are measured and evaluated.

Policy Relevance

Household food security is a primary and critical concern if developing nations are to make headway in attaining economic, social, and political stability and development. It is in this regard that the study gains policy relevance. In generating an understanding of the survival mechanisms and nutritional conditions of food insecure households in rural South Africa, integrated and appropriate policies and policy instruments could be developed to address the prevailing structural constraints that inhibit access to food by particular rural population groups. The same understanding could also stimulate initiatives to undertake an interactive process of policy formulation by soliciting the participation of the same population groups in identifying workable and sustainable solutions at the grassroots level. Finally, it can encourage the planning and implementation of short-term programs that effectively respond to the immediate food, health and livelihood needs, especially of Africans who have had to live marginal lives in their own homeland.

CHAPTER 2 – THEORETICAL FRAMEWORK

Overview

Food security and nutritional well-being are twin issues of development that, in the last 15 years, have become consistent areas of concern for many social scientists and development specialists. The continued interest seems logical: over the last decade and a half, food poverty and/or insecurity as well as malnutrition, especially at individual and household levels, have exacerbated rather than have been arrested or reversed. The breadth and scope of analyses on these issues – particularly in Africa – indicate the pattern and belie macro-level indicators of improved mortality rates and apparent increases in caloric intakes. Famine conditions, man-made or natural, gave appropriate impetus to these initiatives. Towards the end of the 1980s, however, a more critical posture about the two issues gained a foothold. Some of the questions that have been raised and continue to be debated are: How have macro-policies (e.g., structural adjustment) contributed to the lack of access to food among the poor? How has agricultural commercialization figured in the processes of social differentiation as well as in household food security and nutrition? How, and to what extent, has food insecurity masked the collapse of rural and urban livelihood systems, the deficiencies of systems of social security, and the erosion of the moral economy?

These broad questions are inherently informed by the conditions obtaining among many individuals and households as they attempt to evolve mechanisms against increasing deprivation and pauperization. These mechanisms, alternatively called "coping", "adaptive", "survival", "food", "income" and "livelihood" strategies, form the core of the poor's daily struggles to make a living and maintain households and families. These are also the means by which disadvantaged households gain access to food as well as attain some measure of nutritional adequacy. The range of options and decisions about these strategies or mechanisms, however, are shaped to a large extent by households' structure and characteristics as well as resource base, and by the larger context and environment in which the strategies will operate. The differing ways in which these elements are put to advantage by the households necessarily imply varying outcomes, with some having more success in

achieving dietary and/or nutritional adequacy as well as good health, some gaining nutritional adequacy but experiencing poor health, some encountering dietary inadequacy yet enjoying good health, while others experience both dietary inadequacy and poor health.

South Africa's disadvantaged population groups and households are no exception to this prevailing trend among the Third World's poor. But due especially to the exclusionary processes to which they have been subjected, their mechanisms for food security can only be structured around the few options that can be had: migratory employment and/or wage labor, cultivation/use of communal (and, for some, privately-owned) land, domestic or home-based income earning activities, as well as non-market exchanges such as inter-household exchange of labor or food (Muthwa, 1994:171). The outcomes of these efforts are not necessarily different from those experienced by the rest of the world's poor, given that South African households are heterogeneous in terms of their structure and attributes, and in the ways by which they contend with the societal constraints to adequate diets and good health.

These micro-level dynamics of household food security and nutritional well-being are the foci of the proposed research. In particular, the study will analyze rural South African households' 'endowments' and 'entitlements' as they form part of their survival strategies, how household incomes and expenditures mediate food consumption and health status, as well as how these elements singly or interactively pattern household diets and nutritional status.

Major Issues

South Africa in the world economy

South Africa is a nation of approximately 40 million people whose racial identities are African, White, Colored, and Asian. Africans make up the majority of the population at approximately 76 percent, Whites form the second largest group at 12.6 percent, while Coloreds and Asians constitute the remainder at 8.5 and 2.5 percent, respectively (Race Relations Survey, undated as cited in *The Economist*, 20 May 1995: 15). Almost two centuries of apartheid underlie these population groupings that today helps define where socioeconomic and political powerlessness reside.

In the global hierarchy of wealth, the country has been considered as an upper-middle income economy at a GNP per capita of US$2,950 (World Bank, 1995:163), with "a well established industrial complex [that] falls short of the advanced levels of core areas" (Martin, 1990:203). South Africa's Gross Domestic Product in 1994 totaled $120 billion, exceeding the figures obtained by some of the countries considered as high-income economies (*The Economist*, 20 May 1995:9). The basis of this output was services which, in 1991, made up 51 percent, industry constituted 44 percent, and agriculture 5 percent (World Bank, 1993:541). Scarce mineral resources (e.g., gold, diamonds, platinum) continue to be an important source of its export revenues, in addition to agricultural products such as maize, wheat, and processed fruits – making the country the richest in Southern Africa (*The Economist*, 20 May 1995:9; FAO, 1994:94; Lundahl and Moritz, 1993:332; Bryant, 1988:5). This rich mineral resource base was, in fact, pivotal to the development of the country's economy because of the capital that it unlocked for other industries within the country and in neighboring ones, for labor immigration as well as for labor pattern consolidation, and for control over trade, telecommunications and transport, and energy and water systems within the region (Thompson, 1991:17-25; Davenport, 1991:494).

The nation's wealth is not distributed equitably among its people, however. An examination of the 1993 income distribution and purchasing power parity[1] shows that the lowest 20 percent of the population receives only 3.3 percent of the national income while the highest 10 percent has 47.3 percent (World Bank, 1995:221) – a situation worse off than Bangladesh, Colombia and Ethiopia and almost comparable to that of Brazil and Guatemala. Broken down by race, white South Africans have been said to be "on average, nine times richer than blacks" (*The Economist*, 20 May 1995:4), the latter having been in the periphery of governmental priorities until the late 1980s when the dismantling of apartheid commenced.

Inequalities within the country are evident in other areas as well. The adult illiteracy rate among Africans is about 46 percent (compared with 1 percent for whites), and while

[1] Purchasing power parity, according to the World Bank (1995:243), is the commonly used term to refer to the parities computed for a fixed basket of products and, theoretically, should be appropriately labeled as 'purchasing power of currencies'.

nearly half of South African adults do not have a formal job, Africans are disproportionately represented among the unemployed (*The Economist*, 20 May 1995: 14, 9; Lundahl and Moritz, 1993:335). High population densities and inadequate housing conditions are serious problems in the urban townships as well as in the homelands. The housing shortage has been said to range from 1.2 - 2 million units and to be most prevalent, again, among Africans (1993 Race Relations Survey as cited in Fincham et al., 1993:12; May and Rankin, 1991:1352; Wilson and Ramphele, 1989:125). The health situation is on par with low-income economies at a life expectancy rate of 60 years for males and 66 years for females, an infant mortality rate of 52 per 1000 live births in 1993 (World Bank, 1995:215, 219), and maternal mortality rate of 83 per 100,000 live births in 1992 (UNICEF, 1993:28). These estimates vary by race, with the highest incidence occurring among Africans, followed by the Coloreds and the Asians (UNICEF, 1993:27, 39).

Access to land has been a basic issue in South Africa especially among Africans. Designated to occupy 13 percent of the total land area through the Natives Land Act of 1913 and the Native Trust and Land Act from 1936 (both recently abolished), this population group was constrained to find employment and/or farm within territories which have become known as the homelands or bantustans. These territories were mostly held in trust by homeland governments with tribal chiefs allocating the plots for use by the residents (Coles, 1993:719; Lundahl and Moritz, 1993:326; Mukonoweshuro, 1991:177). Consequently, more than 70 percent of the homelands' economically active populations are engaged in the migrant labor system (Mukonoweshuro, 1991:175). Those left behind are predominantly women, children and old people who have become dependent on remittances (Wisner, 1989:443). Farming activities in these areas of low-quality soils are mostly for subsistence such that total food production has been said to be sufficient to support only 30 percent of the population (Lundahl and Moritz, 1993:326; Lemon, 1987:128). Lack of available credit, insufficient water resources, inadequate transportation system, and severe labor shortages typify African farms (Coles, 1993:719; Weiner, 1990:297), a marked contrast to those of the white farmers' which have historically been subsidized by the government (Coles, 1993:719). Lundahl and Moritz (1993:326) illustrate the issue in noting that in 1985, commercial (white)

agriculture utilized approximately 87.8 million hectares and had an output value of 1,000 rand per cultivated hectare. In contrast, the subsistence (African) sector had corresponding figures of about 16.7 million hectares and 21 rand per hectare.

South Africa today is a country that is 50 percent urbanized (World Bank, 1995: 223). While measures to curb the process were established through legislation and/or forced removals, poverty, deterioration in living conditions, and need for cash income – especially in the bantustans – shaped the migratory patterns to urban and metropolitan areas in some homelands (e.g., Transkei, QwaQwa) and in the non-homelands. The results have been overcrowding in hostels[2] and in the rise of peri-urban settlements (Mabin, 1992:19; Heap and Ramphele, 1991:118; May and Rankin, 1991:1352). Employed in the formal or in the informal sectors of the economy, these migrants are South Africa's urban poor whose low cash wage incomes must provide for the urban household as well as for those left behind in the homelands (Heap and Ramphele, 1991:118).

South Africa, at present, is in a stage of transition. Structures have been and continue to be established to make a place for those who have been historically dispossessed. At the same time, relations with the outside world are being re-forged as it redefines its role in the prevailing international division of labor. Various interests are at stake and will be contended with in this process of restructuring, not the least of which is international capital in the country's rich mineral resource base and industries. As the country moves towards achieving a balance between internal and external interests, one social scientist suggests that "the question is not one of how to insulate or even isolate the domestic economy from the international economy, but rather how to reorganize a society towards a more equitable and just order, so as to challenge the relations which historically structure the South African economy and society" (Cassim, 1988:14). The statement gains salience as actions towards societal restructuring necessarily bear on the issue of food security.

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[2] Hostels in the South African context refer to the dormitory-like housing units for migrant labor as created by the migratory labor policy, the influx control regulations, and the Colored Labor Preference policy.

Food security

Food security has been broadly defined as "the secure access by all people to enough food at all times for a healthy life (von Braun et al., 1992:6; Maxwell and Smith, 1992:4; World Bank, 1986:1). Based on this definition, household food security has been referred to as "the ability of households to have stable access to culturally acceptable, safe and nutritionally adequate food through the households' own production or purchase" (Teller et al., 1991 as cited in Smith et al., 1992:181). The simplicity of these definitions masks its complexity. Especially at the household level, two of the basic and interrelated issues are those of access and food adequacy.

Access, in its broadest sense, implies the physical availability of food. That is, it denotes the presence or absence of outlets where foodstuffs may be bought; whether food is produced, purchased or received as a gift; and, whether or not the household has the purchasing power or the ability to buy this commodity. The physical availability of food markets relates to the supply aspect of the food system. It also provides an understanding of a household's dietary (i.e., meal characterization in terms of number of meals or staples vs. non-staples and processed type of food) and expenditure patterns given that small local outlets retail food items that are often higher priced than if directly bought from producers or wholesalers (Hussain, 1990:188; Popkin and Bizgrove, 1988:11; FAO, 1988:63). This is often of great relevance in urban areas where food production, by means of urban agriculture, is frequently constrained by lack of land.

Production, purchase, or the receipt of food as a gift as well as the notion of purchasing power as key elements of access to food are overlapping areas that generally orient a household's consumption (i.e., food quantity and quality) patterns. That is, an individual or a household gains access to food if one is actually able to grow it – implying in turn one's access to production resources – or generate income (through production activities or employment) to buy food, or is able to tap into systems of reciprocity with kin or within a neighborhood or a community (Tabatabai, 1995:34). This idea and the confluence of these elements form the core of the so-called "entitlements" approach to being food secure. It contends that one's access to food is a function of the person's or household's

"endowments" and "entitlements", or that hunger or lack of food is likely to occur in the absence of these two requisites to having command over this basic good (Sen, 1981:45). One's endowments are one's original bundle of ownership such as assets – i.e., land, farm equipment, tools, cash crops, savings, social claims – and personal capacities (e.g., labor) that can be used to procure food (Sen, 1981:45; Sen, 1990:36; Swift, 1989:8-13; Swift, 1993:4; Tabatabai, 1995:34). Entitlements, on the other hand, are all possible combinations of goods and services (including the transformation of endowments into goods and services through production, trade or engagement in labor) that one may legally acquire with the use of one's resources or endowments (Tabatabai, 1995:3; Sen, 1981:46; Crow, 1992:24). Thus, when households cannot produce food due to a paucity of resources or cannot buy food because of the low wage labor rate or because the value of agricultural produce and farm animals are too low in relation to food prices, food insecurity or an entitlement failure occurs (Swift, 1989:9; Sen, 1981:45). The idea could be expanded to also include a contention that lack of access to food, or food insecurity, may likewise result when social systems become ineffective (i.e., when inter-household reciprocity is diminished) as individuation within the social structure evolves due to the commoditization of labor or greater local involvement in the market economy (Thomas and Leatherman, 1990:107; Frankenberger and Goldstein, 1990:23-24; Thomas et al., 1989: 41; Corbett, 1988:1109).

The other central issue in analyzing household food security is that of food adequacy and/or sufficiency. Adequate, sufficient, or "enough" food is generally a question of the extent to which a household is actually able to consume food, in terms of quantity and quality, to meet household members' requirements for immediate physical activities and long-term maintenance of its health. Viewed as being dependent on food availability (Bryceson, 1989:425), its measurement has generally focused on caloric intake – i.e., the consumption of energy-producing food items – with the individual as the unit of analysis (Maxwell and Smith, 1992:8-9). The individual's calorie consumption is often based on daily energy requirements for maintenance which, according to FAO (1985:18) is "pragmatically justified". This multilateral organization contends that increased dietary energy, if derived from normal staple foods, brings with it more protein and other nutrients;

conversely, raising intakes of such nutrients without providing dietary energy is unlikely to be of much benefit to the individual (FAO, 1985:18). The approach necessarily involves value judgments. While the idea of soliciting the subjective assessments of the food insecure themselves has been advanced (Maxwell and Smith, 1992:9; Payne, 1990: 14), the prevailing practice has been to consider food intake as adequate or an individual as food secure when consumption is at least 80 percent of the recommended daily allowance, or 1.5 times the Basal Metabolic Rate, with the latter having been established to be the maintenance requirement for an average individual (von Braun and Pandya-Lorch, 1992:51; Reardon, 1988:1066; FAO, 1985:19). The recommended daily caloric allowance varies (i.e., 1470-2850 kilocalories per day) as it depends on the basis of the calculation and purposes of the analyses for which this guideline is employed (Payne, 1990:15-16). Percentages of country-specific recommended dietary allowances have also been used to define food adequacy levels among individuals (UNICEF, 1993:46; Beaton et al., 1990:46).

A second way by which food adequacy has been assessed is by describing an individual's diet in terms of the variety or numbers of foods consumed over an established time base – i.e., a day, a week, a month or a year (Hodgson et al., 1994:137-139; Shimbo et al., 1994:197-199; Krebs-Smith, 1987:897-899). Also using the individual as the unit of analysis, the approach proceeds from an established area of nutrition science in which it is asserted that a greater food variety almost invariably results in better nutrient adequacy (Hodgson et al., 1994:138). Proponents of the method argue for its applicability in studies examining food and health relationships, its usefulness in different cultures, as well as its lack of assumptions about similarities and differences between foods, about frequency of consumption, and about whether foods are 'healthy' or 'unhealthy' (Hodgson et al., 1994:140-142). As with the caloric intake measure, however, it sets a minimum requirement. This requirement is "at least 15 food items over one week (or greater than 12 a day) for nutritional adequacy, provided that much of the variety comes from plant foods" (Hodgson et al., 1994:146).

Access to food and food adequacy as basic concerns of household food security, thus, are closely linked to nutritional well-being and health. A more specific way by which these

have been viewed are as input indicators for determining nutritional status of population groups with physical and clinical manifestations of deficiency as outcome indicators (Ashworth and Dowler, 1991:122). Access, in this study, will be analyzed in terms of household structure and characteristics as well as survival strategies and how these translate into household income or expenditures, particularly for food. To be addressed as outcome indicators of household food security are food consumption patterns, anthropometric status of children, and the incidence of disease in households.

Households, household structure and household characteristics

Household structure and characteristics are essentially contextual factors that specify the 'building blocks' of food accession activities and processes (i.e., survival strategies). These are also the variables that establish the unit's baseline vulnerability *vis-a-vis* food, and define the household's opportunities and constraints to be food secure. Implicit to the utilization of this set of variables is a view that a household, as a common form of social organization, is the locus of sets of relations (e.g., family, economic) where some resources are managed and claimed collectively, though not necessarily equitably (Evans, 1991:58; Huss-Ashmore and Curry, 1994:109; Crehan, 1992:87-110; Maxwell and Smith, 1992:19-21).

Household structure is an abstraction for any one of the various forms that households assume (e.g., nuclear/extended, no family, single-person, female/male-headed) and for which the issues of composition, headship, and organization of domestic functions are central (Muthwa, 1994:172; Kennedy and Haddad, 1994:682-684; Siqwana-Ndulo, 1993: 143-149; Chant, 1991:7-8; Brydon and Chant, 1989:135). Composition forms a significant part of the concept in that it specifies the size of the household, the members who comprise it, and how these members contribute to the household's collective welfare (Wong and Levine, 1992:98-100; Muthwa, 1994:172; Tschirley and Weber, 1994:168). The issue of headship has to do with the household head's gender, age, and education which, independently – particularly as regards gender – or interactively, shape access to control over and use of resources (including labor force participation opportunities) and household income (Crehan, 1992:91-105; Wong and Levine, 1992:91). At the same time, it is pivotal to determining the internal distribution

of resources among household members (Gustafsson and Makonnen, 1994:381; Kennedy and Rogers, 1992:17-18; Kennedy and Haddad, 1994:688-689). The organization of domestic functions as a critical aspect of household structure, on the other hand, relates to the key roles that household members play in the productive and reproductive activities to maintain this social unit (Crehan, 1992:91-122; Chant, 1991:2; Brydon and Chant, 1989:9-12).

Of equal importance to analyzing households as contexts of access to food are the specific attributes that generally make up the larger part of their set of endowments. These attributes have consisted of household members' educational levels, parental age, years of residence in a given community, and 'material style of life' or the ownership of material wealth such as a bicycle, a radio, and some basic furniture (Vella, 1995:92-94; Leonard et al., 1994:116; Gustafsson and Makonnen, 1994:381; Senauer and Garcia, 1991:380; Kaiser and Dewey, 1991:164). A critical but least covered demographic attribute relating to household characteristic is the issue of the household's race and ethnicity. A frequently used mechanism for maintaining social or class differentiation within a society, race and ethnicity are of relevance as they define and/or circumscribe the productive resources that households can have and activities in which they can engage (Bujra, 1992:352-357; Bernstein, 1992:69). A final set of variables that are crucial to studying households as contexts of food security are their access-to-resource attributes. The more specific areas analyzed in this regard are the type of resources over which households have control (e.g., land, farm animals, farm equipment and implements), size and number of household's land holdings, type of crops grown or crop mix, type and number of farm animals, and type of access over these resources (i.e., whether owned, rented or borrowed) (Haddad et al., 1991 as cited in Frankenberger, 1992:130; Leonard et al., 1994:11; Vella, 1995:92-94). These specific characteristics and household structure have been among the measures used in analyzing a household's ability to produce food for home consumption and for market or non-market exchange.

Studies on how households' endowments relate to well-being in general, and food security in particular, have generated findings that, on the one hand, are consistent with seemingly established patterns, and on the other, are context- and site-specific. Some of the analyses that the literature offers in this regard are presented below.

Household headship, household survival, and well-being. The issue of household headship is one that, in the last ten years, has become central to assessments of household welfare. More specifically, the interest has grown around the asymmetry implied in the conventional use of the headship concept (i.e., a household is female-headed only if there is no man present); the increased incidence of *de facto* female-headed[3] units as a consequence – particularly in Africa – of migration of men in search of wage employment; and in unraveling intra-household processes as well as the dynamics underlying the feminization of poverty (Kennedy et al., 1994:110-111; Delafin, 1995:29-30; Quisumbing et al., 1995:11-13; Haddad et al., 1995:10-18; Muthwa, 1994:165-170; Murray, 1987:242-243; Guyer, 1986:93-96). When examined in relation to gender, age, and education, headship gains importance as it provides 'windows' for understanding the opportunities and constraints to livelihood options as well as into the organization of productive and reproductive resources and activities within the household (Haddad et al., 1995:11; Quisumbing et al., 1995:9-13; Chant, 1991:20-26; Guyer, 1986:96-98). It also sheds light on the health and nutrition patterns that characterize this unit. Several studies provide evidence, for instance, of the relative advantage of male-headed households over their female counterparts. That is, the former tend to be more economically well-off as a consequence of gender ideologies and institutionalized divisions of labor that favor males' better access to resources, wage employment, and market-related processes (Haddad et al., 1995:57; Gisbert et al., 1994:111; Gustafsson and Makonnen, 1994:381; Mkandawire, 1993:73; Geisler, 1993:1970-1973; Safa and Antrobus, 1992:53-54). It is likewise in these households that women's or spouses' (and other household members') labor are appropriated for male heads' agricultural production particularly in peak periods of cultivation and harvest, or in instances when male heads and other adult male members engage in labor migration (Katz, 1995:329-332; Francis, 1995: 210-211; Geisler, 1993:1970-1972; Vickers, 1991:21-31). The seeming net effect of these processes is that male-headed households are able to diversify their insecure income and food sources more than female-headed households (Onyango et al., 1994:1638). Moreover, households with male heads

[3] *De facto* female-headed households are those in which the self-declared male head is absent for at least 50 percent of the time. This is often contrasted with *de jure* female-headed households where the woman is considered the customary and legal head of the unit (Haddad et al., 1995:11)

have been shown to consume more of their home-produced foods and, in cases where there are relatively more women than men in the household, to have relatively larger food budget shares (Rogers, 1996:114; Haddad, 1991:6). This situation notwithstanding, *de facto* and *de jure* female-headed units appear to have children that are nutritionally on par and, in some instances, better off than those in male-headed ones (Rogers, 1996:122; Kennedy et al., 1994:118-120; Kennedy and Haddad, 1994:694). This observation obtained in Ghana, Kenya, Malawi, and the Dominican Republic and has been attributed to the quality of diets in female-headed households (Rogers, 1996:122-123), their food preservation techniques, and to their child-oriented rather than income earning-related spending patterns (Kennedy and Haddad, 1994:686-694; Kennedy et al., 1994:118-120). It has been suggested, however, that the effects of gender of household head may interact with household income and gender of preschooler children in analyzing child nutritional outcomes as a measure of well-being (Kennedy and Haddad, 1994:693).

Household heads' educational levels bear as well on households' income generation activities and well-being. Specifically, it can be instrumental to productive farming operations and to gaining access to formal employment opportunities or to additional sources of income outside farming (Evans and Ngau, 1991:539; House, 1991:880-881). This seems to be demonstrated in a sub-location in western Kenya where households headed by men who had no secondary education were unable to access well-paid employment in urban labor markets or within their localities (Francis and Hoddinott, 1993:139). On the other hand, among predominantly male-headed households in a sub-district in southern Sudan, returns to farming to a year of schooling were noted to be very high (House, 1991:883). In rural and urban Lesotho, households whose heads (gender unspecified) were highly educated tended to be about twice as well off as those whose heads had no education (Gustafsson and Makonnen, 1994:383). Analyses of educational levels of women as the other head of household also tend to show a linear effect on households' well-being, particularly in terms of health and nutrition. A finding that supports this relationship is that among cassava-producing households in Ecuador, mothers' (and fathers') education emerged as a significant predictor of children's nutritional status (Leonard et al., 1994:122). In a similar vein, a study

in low-income urban areas in Tanzania revealed that children of mothers with more than 8 years of schooling were approximately 2.2 times more likely to be nutritionally normal than those of mothers with 5-8 years of schooling (Mbago and Namfua, 1992:303-304). Apparently, mothers' higher educational attainment improves the productivity of household activities (e.g., child care), and contributes positively to the quality of decisions that fall in the women's domain especially *vis-a-vis* choice of food and related concerns that generate good nutrition (Sahn, 1994:52).

The significance of age for headship seems less clear-cut. A pattern that surfaces in the southern Sudan setting is that better-off households tended to be headed by younger men (House, 1991:876). These young male heads appear to have achieved this status by enhancing their production through improved crops, use of fertilizers, and frequent intercropping (House, 1991:877). Younger heads in Ugandan households also demonstrated this modality in that their households had one of the higher per adult equivalent income[4] (Bigsten and Kayizzi-Mugerwa, 1995:192-194). This has been attributed to their entrepreneurial efforts since – having relatively little access to land – they have engaged themselves in small-scale 'business' (e.g., milling, beer brewing, construction, trade and services), participated to some extent in wage employment, and derived some income from farming (Bigsten and Kayizzi-Mugerwa, 1995:192). A consistent observation was noted in a study of income diversification and agricultural productivity in a rural district of Kenya. That is, while the age of household head was not a significant predictor of a household's non-farm income, older heads tended to have less income from non-farm sources due, seemingly, to their lower levels of education (Evans and Ngau, 1991:539). Focusing on nutritional status as a measure of well-being, on the other hand, Pelto et al (1991:1138) found in a highland Mexican area that older fathers, compared to their younger counterparts, were more likely to have children with lower caloric intake. Mother's age has been shown to impact as well on children's nutritional status. In particular, children of young mothers (aged less than 18-25 years) were less likely to be nutritionally normal than children of older mothers (Mbago and

[4] The per adult equivalent income is that income per household member where those younger than 13-15 years are assigned gender-specific weights in the range of 0.27 to 0.97 (Trairatvorakul, 1984:49).

Namfua, 1992:304; Strauss, 1990:247). It would seem than that having younger heads directly benefits the household in terms of their economic rather that nutritional welfare. It is equally likely, however, that the effects of age on the health and nutrition of the household members are mediated by the unit's socioeconomic status.

Household composition, household survival, and well-being. Household composition is a concept that holds a number of concerns that generally affect the distribution, allocation and/or utilization of household resources (e.g., labor, time, food). In essence, the concept describes the constituent members of the household particularly in relation to size, number of dependents, available household labor or labor power, and whether it consists of nuclear or extended family/non-family members (Chant, 1991:231; Muthwa, 1994:172; Haddad et al., 1995:13; Gustafsson and Makonnen, 1994:382).

Analyses utilizing household composition in assessments of social differentiation and/or well-being reveal that smaller households, while tending to have a high per adult equivalent income and per capita income (Bigsten and Kayizzi-Mugerwa, 1995:192; House, 1991:876), as well as having lower consumption demands (Huss-Ashmore and Curry, 1994:109) are likely to have relatively more members working exclusively in farming their own plots (Mazur, 1991:102; House, 1991: 876). In addition, they may engage in nonagricultural activities as a supplementary source of income (Mazur, 1991:104) or, rely to a large extent on these nonagricultural sources when they have little access to land (Bigsten and Kayizzi-Mugerwa, 1995:192). While this may imply that larger households will be in a better position in terms of livelihood or income strategies and in their health and nutritional status, the situation can be contingent on the households' number of children and elderly dependents as well as adult members (Wong and Levine, 1992:99; Muthwa, 1994:172; Gustafsson and Makonnen, 1994:382). In Lesotho, no clear relation was established between the household's number of children and the economic well-being of its members (Gustafsson and Makonnen, 1994:383). This appears to have been qualified in a study in Soweto, however, in that the household's material welfare depended on whether the children were of school age (hence, a higher dependency rate) or grown up (Muthwa, 1994:172). High dependency rates – sometimes referred to as the consumer-producer ratio – especially impact

on the mother's/female head's production or income-earning activities and domestic duties (Huss-Ashmore and Curry, 1994:109). On the one hand, the demands on her time for nurturing tasks increase thereby affecting the extent to which she is able to participate in the labor force (Wong and Levine, 1992:98). On the other hand, the need for income to meet the household consumption needs may serve as the impetus for her engagement in off-farm activities (House, 1991:881). The implication of high dependency rates and, thus, of greater consumption demands, on the household as a unit appears to have been to either allocate more of its members in its own fields or to diversify income sources by having other members engage in agricultural wage work and/or by labor migration (Mazur, 1991:102-104). Its particular effect on children, on the other hand, may be a decline in nutritional levels as food allocations are stretched thinly among members especially in large households (Pelto et al., 1991:1139; Staatz et al., 1990:1315-1316).

Having grown up children frequently signifies the availability of income-generating members, a condition that has been found to be associated with household well-being (Haddad et al., 1995:13; Muthwa, 1994:172). In addition to their income-earning potential in local and non-local agricultural and nonagricultural wage employment, these adult members serve as a labor resource for production activities in the household's own farm(s) and for the domestic functions within the household (Bigsten and Kayizzi-Mugerwa, 1995:192-193; Wong and Levine, 1992: 99; House, 1991:881; Immink and Alarcon, 1991:296; Mazur, 1991:102-104). This was the observed pattern among most households with single female heads in rural Guatemala where having a daughter over the age of 10 was associated with a 30 percent increase in women's remunerated labor time (Katz, 1995:335). The presence of additional adult extended family members have also been found to enhance opportunities for well-being when said members can be called upon to provide assistance in the performance of the household's reproductive functions (Wong and Levine, 1992:98-99; Immink and Alarcon, 1991:296), as well as in the women's production activities for home consumption (House, 1991:881). These arguments were offered as possible explanations for why large households, compared to medium-size ones, in a rural mid-western area of Kenya were observed to have better fed children (Kigutha et al., 1995:699). A contrary contention has

been shown among rural small-holders in Mozambique, however, in that the number of non-elderly adults in the household can be negatively associated with calorie availability for its members (Tschirley and Weber, 1994:168). Such an outcome appears to stem from a pattern that household energy or food production was unable to keep pace with the calorie needs of the members.

Household educational levels, household survival and well-being. While the number of household members who are able to contribute to household welfare may be said to form a large part of the unit's human capital, its formal educational levels make up the other significant part. This can be seen in the frequent use of this factor as a measure of socioeconomic status in an attempt to determine how one's educational levels translate into formal sector employment and/or farm productivity and, subsequently, into household income and welfare status.

Studies that have delved into adult household members' educational levels and well-being validate the seeming centrality of this factor in household income-generating activities. The findings of the study on Ugandan households lend support to this contention in that the attainment of post-primary education by household male members significantly impact on their access to formal employment while those without education have, as their options, farm and estate employment or other income sources (Bigsten and Kayizzi-Mugerwa, 1995:200-201). A similar result obtained in a study in western Kenya. That is, offspring of those in the top per capita income quintile (who can readily have their children educated) found employment in the public sector or highly paid work in the private sector and contributed to the household income through remittances (Francis and Hoddinott, 1993:139). This seems to be further substantiated in Lesotho where the education of other household members, in addition to its head's, significantly affected the individual members' well-being (Gustafsson and Makonnen, 1994:193). The impact of adult members' formal educational levels on the health and nutritional welfare of the household appears to be an area that is little explored. It can be argued to be positive, however, in that increased education generates a greater awareness of health in general, and results in greater importance attached to health and nutrition (Zaidi, 1988:120).

Household racial affiliation, household survival and well-being. The concept of race as an issue for household survival and well-being is one that appears to have been less studied in a developing country context. This could be due to the fact that while developing country households can be affiliated to specific ethnic and/or language groups, the reality is that their racial affiliation is a concern that does not bear on their day-to-day existence. South Africa is unique in this regard. That is, while a majority of its people live the lives of those in developing nations, their race-based experience parallel those of groups of different skin colors in developed countries and, to some extent, that of the harijans or scheduled caste in India.

Efforts to attain a level of well-being particularly among rural African households generally depend on the households' structure and their respective locations (Siqwana-Ndulo, 1993:154-162; D'Souza et al., 1987:8-19). For the most part, however, households have employed labor migration or the relocation of a member/some members to an urban fringe, a metropolitan area, or a commercial farm district (Coles, 1993:719; Siqwana-Ndulo, 1993:142). This stems from the prevailing lack of employment opportunities in the bantustans, lack of access to land, and insufficient production yields from subsistence farming (Coles, 1993:719; May, 1990:177-178; D'Souza et al., 1987:8). To augment the irregular and often insufficient remittances that they receive, 'relict' households (Sharp and Spiegel, 1990:539) or the household members who had been left behind – frequently the wife and other dependents – engage in such activities as selling snuff or traditional medicines, selling vegetables, beer brewing, or running local transport services, the incomes from which tend to be occasional and not substantial (D'Souza et al., 1987:8; Sharp and Spiegel, 1990:540-541). Other households that appear to have been relocated in areas that were more amenable to agriculture or seem to have been long established and settled in a relocation area, on the other hand, tended to produce their own food and to be better off in terms of ownership of tradable assets such as goats and sheep (D'Souza et al., 1987:10-12). Lacking other options, the less fortunate households – especially the elderly women who support grandchildren and dependents left in their care – depended on their pensions or on the regular

rations that the government provided as a temporary measure for households that had yet to settle in their new communities (D'Souza et al., 1987:14; Siqwana-Ndulo, 1993:155).

Household access-to-resource attributes, household survival and well-being. As with educational levels, the resources over which households have access is a widely employed indicator of socioeconomic status. The rationale for this is that having a household labor resource base and one's ownership or usufruct over livelihood-related endowments such as land, livestock (cattle, goats, sheep), farm equipment (plows, tractor) and tools serve as one's capital assets for production activities, for home consumption or for the generation of purchasing power.

Of the resources over which a household can have access, land (and for pastoral households, livestock) appears to occupy a key role in establishing rural household welfare (Tschirley and Weber, 1994:168; von Braun et al., 1992:16; Reardon et al., 1988:1070). The extent to which such access can provide for household needs, however, depends on the size and/or number of the land holdings, the availability of family labor or the ability to hire those who can work the land holdings, access to work animals such as oxen, the type of crops that are grown as well as access to market processes (Bigsten and Kayizzi-Mugerwa, 1995:192-196; Siqwana-Ndulo, 1993:162-163; Reardon et al., 1988:1067; House, 1991:873). This is corroborated by the study in southern Sudan where a seeming trend is the rise in affluence with the size of land holding (Bigsten and Kayizzi-Mugerwa, 1995:194). Specifically, for households with no more than two hectares of land and an adult equivalent of 4.9 persons, dependence is high on wages and 'business' profits while for those having 5-10 hectares and an adult equivalent of 8.3 persons, less of their income shares come from 'business' profits (Bigsten and Kayizzi-Mugerwa, 1995:194). Von Braun and Pandya-Lorch (1992:42), however, offer contrary observations in noting that the physical size of the farm itself did not seem to have a large effect on the prevalence of malnutrition although the malnourished rural poor did tend to have small- to medium-sized farms.

Crops grown appear to be a factor as well in analyzing access to land with well-being. In particular, the cultivation of cash crops (e.g., cotton, cashew in Mozambique, sugarcane and sorghum in Kenya, maize and sorghum in Zambia) were seen to have significant effects

on the cash income of the households (von Braun, 1994:39-41; Tschirley and Weber, 1994:168). The smallest farm households though were less likely to incorporate such crops in their cultivation activities (von Braun, 1994:62). This would seem to be the case in southern Sudan in that the poorest households, heavily dependent on their crops for consumption and lacking in access to market processes, concentrated in growing cassava which is a principal crop consumed during famine (House, 1991:875).

Type of access to land is also an issue that has been assessed *vis a vis* household welfare, albeit one that has been less analyzed as regards the latter in African settings. This would seem to be due to the predominant practice of having usufruct rather than ownership based on actual land titles (Letsoalo, 1987:3; Bryceson, 1989:427; House, 1991:869). It is particularly relevant to the South African context, however, since agricultural support services in this country have been historically oriented towards those who have actual ownership rather than to those who have usufruct rights over land (Lundahl and Moritz, 1993:326). Inability to produce enough either for home consumption and/or for crop sales, as such, can be said to have shaped South African rural households' non-local wage employment activities (Sharp and Spiegel, 1990:537), income levels and well-being.

Access to livestock (goats, cattle, sheep) and farm equipment are likewise forms of wealth that have enabled households to maintain for themselves a level of well-being. Cattle or farm equipment are essential to crop cultivation and lack of access to either (through actual ownership or ability to rent) has been found to inhibit production activities (Siqwana-Ndulo, 1993:164). In addition to this basic use, these farm animals (including pigs and chicken) are income and food sources during production shortfalls and periodic needs for cash (Reardon et al., 1988:1067; Siqwana-Ndulo, 1993:164-165; Bigsten and Kayizzi-Mugerwa, 1995:189). It has been asserted, however, that for households in northern Mozambique, livestock production has played less of a role in the income strategies that have been employed (Tschirley and Weber, 1994:166).

While access to land, crop mix, and access to other physical farm assets make up important components of a household's survival activities, that of availability and effective utilization of household labor is a critical element also of one's set of endowments and,

hence, to gaining food entitlements. As implied earlier, this factor appears to interact with access to land, household size, consumer-producer or dependency ratio, and opportunities for local and non-local wage employment. Specifically, households that have little or no access to land may be forced to allocate their labor resources to off-farm activities to generate a measure of purchasing power for the household (Tschirley and Weber, 1994:166; Bigsten and Kayizzi-Mugerwa, 1995:192). The strategy may also be simultaneously undertaken with farming activities when there is a high dependency ratio, or more consumers than producers, in that the household may retain labor resources in own production for home consumption while others engage in off-farm agricultural or nonagricultural income earning (Mazur, 1991:102-104; House, 1991:876-877). The participation of women and children in farming activities appears to be an important link to the use of these complementary strategies in that they are expected to work the farm while the men migrate for wage labor (Francis and Hoddinott, 1993:125; Crehan, 1992:107; Hewitt and Smyth, 1992:88; Martin and Beittel, 1987:224) or seek entry in small-scale business enterprises or petty trade (Bigsten and Kayizzi-Mugerwa, 1995:192).

Household survival strategies

Survival strategies may be defined as the set of responses that households take in order to reduce risks or uncertainties over food security and livelihoods and/or to adapt to changing socioeconomic conditions that adversely impact on the daily life of the household (Muthwa, 1994:168; Chant, 1991:7; Frankenberger and Goldstein, 1990:21; Corbett, 1988:1100). As a concept that has found extensive application in African settings, it denotes both short-term self-insurance mechanisms to offset seasonal imbalances in access to food as well as the more permanent responses that the rural and urban poor develop against food insecurity and inadequate incomes (Bangura, 1994: 790; Davies, 1993:60; Adams, 1993:41; Campbell, 1990:143-156). And, while the term 'strategy' implicitly signifies a "well worked-out plan for the allocation of family labor resources," the host of actions can also be unplanned since "obtaining additional income by any means" frequently underlies these efforts to survive (Rodgers, 1989:20; Corbett, 1988:1100).

The range of survival or food accession strategies that the poor have employed generally consists of those that are based on ownership of, or rights over, an asset portfolio – e.g., land, farm animals, farm equipment and/or tools, craft-related materials and tools; those that build upon the availability of household labor that can be mobilized for employment; and those that draw on an alternative set of options that are neither asset- nor employment-based (Bangura, 1994:793-798; von Braun and Pandya-Lorch, 1992:39; Swift, 1989:11-13; Swift, 1993:4-6; Campbell, 1990:146-150).

Asset-oriented strategies. As the term implies, asset-based strategies are production-related responses to food insecurity and depend on one's access to resources. Widely studied in the context of rural households, this set of mechanisms frequently entails adjustments in asset utilization where such assets exist. Those that own or have rights over a parcel (or parcels) of land, for instance, may bring about changes in their production practices while maintaining traditional ones and allocating a specific land area in food production for home consumption (von Braun et al., 1992:20; Frankenberger and Goldstein, 1990:22; Longhurst, 1986:27-28). These changes have involved cultivating multiple varieties of crops, frequently including cash crops or early ripening varieties; extension of farming to marginal areas or field dispersion; increasing crop densities and shortening the fallow on the old field system or, planting on an intercropping, rotational, or staggered basis (Peters and Herrera, 1994:314-320; Adams, 1993:42; Thomas and Leatherman, 1990:105-106; Thomas et al., 1989:43; Longhurst, 1988:29). Shifts in cropping patterns, in particular, have become an integral component of land-holding households' efforts to intensify production activities and have been critical to gaining a fairly secure access to food and diversified diets. This is because crop yields can be planned and timed for home consumption or for market and/or non-market exchanges at varying periods. Households that have access to food storage receptacles are provided an added advantage since surplus grain harvests can be set aside for future use (Devereux, 1993:53; Thomas and Leatherman, 1990:104). Stored grains, consequently, become assets that offer a strategy option especially when fluctuating markets for agricultural produce, inflated food prices, low yields, and drought render households vulnerable to these food insecurity-creating conditions. There do exist households that will

plant less cash crops and be unable to store grain harvests, however. For this set of households that can frequently be dependent also on gathered foods for subsistence, intercropping food crop varieties serves as a primary survival strategy as they effectively ensure the timely and immediate availability of food (Thomas and Leatherman, 1990:105; Longhurst, 1986:27-28).

The other assets around which mechanisms to secure food (or incomes to buy food) have been anchored are livestock (cattle, goats, sheep) as well as farm equipment and/or tools (e.g., plows, tractor, hoes). In general, these 'stores of value' form part of a household's normal production activities for home consumption and income-earning purposes (Campbell, 1990:147-148; Reardon et al., 1988:1068-1070). During stresses in household food availability, however, the sale of these assets – including land – becomes an important means to survival particularly when the range of possible actions has been exhausted (Bangura, 1994:793; Campbell, 1990:147; Frankenberger and Goldstein, 1990:23; Corbett, 1988:1106). The disposal of such properties has been one of the primary responses to food deficits by households that have fewer liquid assets and limited access to labor and credit (Campbell, 1990:147; Frankenberger and Goldstein, 1990:23; Reardon et al., 1988: 1070). The success of this mechanism, however, is delimited by the period during which such 'distress sales' are undertaken. That is, the prices that are obtained tend to be often lower than are anticipated particularly when these sales occur simultaneously for other households (Walker, 1995:149; Frankenberger and Goldstein, 1990:23; Corbett, 1988:1107).

An additional asset-based recourse to which rural households have turned is home-based local craft production such as basket or textile weaving and ceramics making. Often an additional income-earning enterprise for a household, it has become less of an option in recent years. The decline in the utilization of this survival mechanism has been attributed to several factors, among which are the commercialized reproduction of said crafts, time commitment to wage labor if household members involved are also employed, and the women's increased workload as more of the adult male as well as female household members migrate to other farms or towns and cities to find employment (Thomas and Leatherman, 1990:105-106).

Employment-based strategies. Engagement in wage labor forms the core of employment-based survival strategies. Especially for households that do not have access to land or whose access is limited (in terms of land area and quality of land), do not have the resources to make their farms more productive, or lack the other assets that can temporarily ease declining entitlements to food, the sale of its labor is seen as a more viable alternative or as a parallel strategy to own agricultural production and other food accession efforts (Frankenberger and Goldstein, 1990:24; Corbett, 1988:1107; Longhurst, 1986:27-28). Household labor resources are reallocated and even withdrawn from own farms for local and non-local off-farm employment as well as for the small-scale buy-and-sell enterprises that are expected to generate the cash incomes for the household's food and other essential needs (Bigsten and Kayizzi-Mugerwa, 1995:181, 200; Francis and Hoddinott, 1993:127-128). At the same time, adolescent family members are mobilized for particular tasks such as herding, collecting fuel and child care or to also undertake paid work in other farms (Bangura, 1994: 795; Francis and Hoddinott, 1993:128; Crehan, 1992:120-122; Hewitt and Smyth, 1992:88; Thomas and Leatherman, 1990:107). Adult members may engage themselves in wage-paying occupations such as seasonal sharecroppers or as plantation laborers, as shepherds to herd owners, as miners, well-diggers, or as petty-traders (Devereux, 1993:58; Corbett, 1988:1107; Reardon et al., 1988:1071). The choice of off-farm activities has been said to be a function of social differentiation and gender differences. This is reflected in a pattern where households with fewer resource endowments seek employment in demand-dictated and increasingly competitive agricultural and unskilled remunerative work, while richer households concentrate their activities in better-paying enterprises that require higher levels of skills, risks and capital such as medium-level commerce, cross-border produce trade, tailoring and repair work (Bangura, 1994:794; Francis and Hoddinott, 1993:127, 136-137; Reardon et al., 1988:1069). Women in both types of households, on the other hand, are constrained in their initiatives due to traditional household responsibilities, inequalities in land ownership and rights, differential access to labor, and gender ideologies that obviate their participation in some of the high-paying off-farm jobs (Bangura, 1994:794; Quisumbing, 1995:3-4; Haddad et al., 1995:2; Tabatabai, 1995:29).

Labor migration to towns and cities is also an important employment-based strategy that rural household members, or even entire households, have employed. In these areas, formal and informal sector occupations are the avenues through which income and goods are earned. Lack of formal-sector skills and experience, however, limit most of these migrants – along with the rest of the urban poor – to the frequently unstable as well as poorly and insecurely paid informal activities (Hussain, 1990:186; Tabibzadeh et al., 1989:39; Popkin and Bizgrove, 1988:12; Pryer and Crook, 1989:3; Nattrass, 1987:262). Such informal activities have included primary and secondary employment in construction sites, in factories, and in services on part-time and casual or temporary bases (Pryer and Crook, 1989:3; Popkin and Bizgrove, 1988:12). Meager incomes derived from these sources shape other income strategies for food that these migrants and urban poor households evolve. Among these are participating or investing in such enterprises as street vending or hawking, food preparation and retailing, dressmaking, or working as market sellers (Bangura, 1994:796; Popkin and Bizgrove, 1988:12; Nattrass, 1987:869-870). Again, a highly differentiated environment determines, to a large extent, the options that have been and can be explored. That is, households that do not have the resources for small-business enterprises, lack networks of social support, or lack the skills necessary for less competitive jobs tend to converge at the lower end of the informal-sector operations where activities are oriented mainly towards survival (Bangura, 1994:794-796; Nattrass, 1987:867).

Alternative strategies. The third set of survival strategies that the poor have relied upon to gain access to food is a host of activities upon which they generally fall back, whether in the absence or in addition to their efforts, to mobilize resources. Characterizing both rural and urban households, these alternatives have included food rationing (i.e., by taking smaller portions or skipping meals); foraging and gathering of (wild or discarded) foods; taking out cash or in-kind loans; and cutting back on other household expenditures (Bangura, 1994:800; Thomas and Leatherman, 1990:105-107; Corbett, 1988:1107-1109). Central to these 'non-market' strategies are systems of reciprocity or claims[5] that households

[5] Claims have been employed as an abbreviated term for "a variety of redistributive processes within smaller and larger communities, ranging from households and extended families, through shallow kinship groupings to major lineages, and up to the level of traditional and modern political formations" (Swift, 1989:11).

develop and draw upon to secure a minimum level of subsistence for its members particularly in periods of food uncertainty or scarcity (Adams, 1993:41-42; Swift, 1989:11-12). Involving horizontal and vertical exchanges between and among households, the relationships are rooted in the social (as well as economic and political) bonds or networks of kinship, friendship and patronage within and beyond a given community (Adams, 1993:41-42; Swift, 1989:11-12; Swift, 1993:5-7; Campbell, 1990:148). For many rural households, these are customary safety nets and consist of inter-household exchanges of food and labor (Muthwa, 1994:171; Swift, 1989:11-12); participation in collective labor groups, cultivation of communal fields, and village cereal banks (Adams, 1993:42-43); and temporary fostering of children to enable adult household members to earn a living (Spiegel et al, 1995:6-9; Spiegel et al., 1994:11; Adams, 1993:43; Thomas and Leatherman, 1990:107).

Access to these alternative set of strategies or traditional systems of social security, however, may be shaped by the extent to which a household is integrated into the social and economic networks of exchange (Adams, 1993:42-43; Peters, 1986:138-141) and/or by the household's socioeconomic status especially in socially stratified communities (Campbell, 1990:148; Swift, 1989:13). In particular, long-established households – which may consider mutual aid obligatory – are more likely to have secure access to these support mechanisms than those with less developed ties (Adams, 1993:43). Low-status households, on the other hand, have been noted to have the fewest claims and, as such, are more likely to be vulnerable to food insecurity compared to those who have higher asset, including claims, status (Swift, 1989:13). As resources that can be exchanged or shared dwindle, however, this practice of generalized reciprocity contracts correspondingly (Swift, 1993:6; Campbell, 1990:149; Thomas et al., 1989:1109). In such instances, groups of people – first other villagers or tribe or clan members, then distant kin, then close kin – are said to be progressively excluded and to stop at the boundaries of the household (Swift, 1993:6; Thomas et al., 1989:44). It has also been noted that individuals in households may even cease to share food with other members in extreme situations (Swift, 1993:6; Thomas et al., 1989:44).

The particular survival mechanisms that rural households have relied upon essentially vary according to the persistence of their food insecurity condition and their ability to mobilize family resources, assets and social networks, among others (Bangura, 1994:790; Sharp and Spiegel, 1990:539). The type of responses that will be demonstrated, however, has been said to follow distinct sequences as households move through stages or phases of food deprivation and/or destitution (Corbett, 1988:1103-1105; Frankenberger, 1992:92-95; Frankenberger and Goldstein, 1990:33; Campbell, 1990:152-153; Thomas et al., 1989:43, 49-51). That is, households will tend to employ survival strategies that are of least cost and are reversible (e.g., borrowing grain from kin) at low levels of food insecurity, and will progress towards mechanisms entailing increased commitment of domestic resources and irreversibility (e.g., disposal of assets) as lack of access to food persists and intensifies (Corbett, 1988:1106-1107; Thomas et al., 1989:50; Frankenberger and Goldstein, 1990:23). A characteristic pattern that emerges within this seemingly linear movement, however, is that households have simultaneously taken multiple and/or multidimensional survival strategies from early to late stages of food deprivation (Devereux, 1993:58; Corbett, 1988:1100; Longhurst, 1986:27).

Multidimensional survival strategies have been referred to as the portfolio of income-earning activities that households have engaged in to sustain livelihoods (Bangura, 1994:792). In the context of food security, said portfolio is the mix of response mechanisms that has been utilized to effectively manage a household's resources or endowments (e.g., time, assets, labor, human capital) in order to supplement season-based food production activities and/or shortfalls in home-produced foods, as well as 'to restrain the depletion of food and non-food resources' (Devereux, 1993:57; Thomas and Leatherman, 1990:105; Longhurst, 1986:30). Beyond these immediate and long-term goals for ensuring food security, multiple survival strategies have been evolved by rural and urban households in response to increased economic vulnerability arising from inaccessible food prices, high costs of production inputs, declining real wages, and increased management strategies of labor casualization by private industries (Bangura, 1994:792; Dreze and Sen, 1989:5-6; Griffin, 1987:21). Such strategies have acquired a multidimensional character as households

simultaneously harness and/or undertake food- and income earning strategies with their assets, labor power, and alternative mechanisms for adequate quantities and quality of food (von Braun and Pandya-Lorch, 1992:44; Devereux, 1993:58; Thomas and Leatherman, 1990:105-106).

Survival strategies, income, and well-being. The effects of the foregoing survival strategies on households' health and nutritional status have been assessed in terms of how these have contributed to the generation of purchasing power as well as to the food consumption and nutritional status of household members. Analyses of income sources in rural Uganda note, for instance, that amounts earned by households, except those in the lowest quintile, tended to come from farming, a large proportion of which is made up of the imputed value of subsistence food consumption. Crop sales and livestock income were the other sources that contributed to the overall amount received. Other strategies that appear to have worked for these households in terms of generating income were small-scale business enterprises and wage employment, the latter enabling the receipt of remittances among the poorest and well-off households (Bigsten and Kayizzi-Mugerwa, 1995:189-193). The same pattern has been shown in southern Sudan (House, 1991:873-875). That is, households derived nearly two-thirds of their non-cash income (i.e., crops for home consumption) from farming and realized their cash amounts from crop sales, local and non-local wage employment, and off-farm activities such as carpentry, blacksmithing, beer brewing, and the like (House, 1991:869-874). In three districts of Mozambique, these diversification efforts outside of own farm activities appear to be positively associated with household income (Tschirley and Weber, 1994:166).

Cash cropping strategies have also been found to significantly impact on household earnings. This would seem to be true for households in Rwanda, Zambia, Malawi and other African countries where cash crops such as maize, legumes, potatoes, tea, and tobacco were observed to increase income levels (von Braun, 1994:40-41). At the same time, however, the increase in income can vary with the extent to which households cultivate or specialize in said cash crops. Incomes of tobacco specialists in Malawi, for instance, were more likely to be much higher than that of small tobacco producing households, the latter even having

slightly less than their non-tobacco counterparts (von Braun, 1994:41). The implication of cash cropping for household labor in Zambia was that of male and female household members' greater inputs into the farm by 46 percent (von Braun, 1994:41).

While similar multidimensional survival strategies characterize households' efforts to generate purchasing power, differential positive effects were noted on their cash and non-cash income levels. More specifically, households that had larger land holdings, larger livestock holdings, had educated members, and had greater access to market processes for crop sales tended to benefit more – in terms of consumption from crop production and cash income – from their farm and off-farm activities (Bigsten and Kayizzi-Mugerwa, 1995:189-202; House, 1991:873-880). This implies that with their greater resource base, the diversified structure of their income strategies permitted greater returns compared to the same but fairly unproductive options (e.g., low-income off-farm activities) of households with limited endowments.

The choice of survival strategies appears to also directly bear on food consumption and nutritional status. Of the asset-based strategies, livestock holdings has been noted to be a strong predictor of per capita energy derived from animal foods (Leonard et al., 1994:118). Amount of food that a household grows in its garden, on the other hand, was found to be not significantly related to a child's nutritional status (Shack et al., 1990:65). The effects of cash cropping in the western highlands of Guatemala tended to be mediated by the income generated from it which, in turn, was found to be positively associated with higher levels of household food availability and the nutritional status of young children (von Braun and Immink, 1994:201). A contrary finding was observed in Swaziland in that reliance in non-food cash crops (i.e., cotton) showed negative effects on food consumption and nutritional status of women and children (Huss-Ashmore and Curry, 1994:119).

Employment-based strategies have likewise been shown to influence food consumption patterns and nutritional status. In Swaziland, for example, the high participation of female labor in agriculture as well as a large number of crop enterprises was noted to affect the women's food intake negatively, a finding that has been suggested as reflecting the lack of economic options other than agriculture for households (Huss-Ashmore

and Curry, 1994:119). In southwest Uganda, having a household member working in other people's land appears to be negatively associated with children's height-for-age anthropometric index while having a father working as a professional or as export crop farmer was positively associated with children's mid-upper arm circumference, also an anthropometric indicator (Vella, 1995:91). Along these lines of evaluating children's nutritional status *vis a vis* household members' employment-based activities, Mazur and Sanders (1987:29) observed in a peri-urban community in Zimbabwe that children whose fathers were involved in petty trade or unskilled labor experienced the greatest underweight, stunting, and wasting problems.

Household income and household expenditures

Household income is a micro-level indicator of welfare that has been used to denote the cash as well as the monetized value of goods and services that a household receives, including the imputed value of its dwelling unit (Kumar, 1989:10-11). For most households in developing countries, the overall receipt may consist of wages, sales from agricultural produce and products, profits from small-scale business enterprises or petty trade, remittances from labor migration, pensions, food stamps, and non-cash items such as food transfers or rations from governmental or nongovernmental food schemes, the produce consumed from household's own production activities, as well as the in-kind payments received for services rendered and goods sold (Bigsten and Kayizzi-Mugerwa, 1995:189; Gustafsson and Makonnen, 1994:382; Tschirley and Weber, 1994:164-165; Francis and Hoddinott, 1993:130; Wallerstein and Smith, 1992:7-9; House, 1991:873-874; Reardon et al., 1988:1068-1071). Its centrality in household well-being, particularly food security, lies in the fact that it provides the household with a measure of purchasing power and/or access to market foods as well as goods and services (Leonard et al., 1994:125). To assess its distributional effects within the household, its analysis has been made in terms of per capita income (or the amount that goes to each individual member of the unit) and/or by means of

per adult equivalent[6] income (or, as noted earlier, the income per household member where those under 13-15 years are given a gender- or non-gender specific weight ranging from 0.27 to 0.97) (Trairatvorakul, 1984:49; Haddad et al., 1995:8; Bigsten and Kayizzi-Mugerwa, 1995:188; Gustafsson and Makonnen, 1994: 375-376).

Assessments of income in relation to household well-being – specifically, food security – include one that looks into income levels and forms of income received by the household and how both shape food intake as well as health and nutritional status. One such analysis is that on the earlier cited study of southern Sudan households where the poorest households had the most relative deprivation in their low protein intakes, an expectation of impending food shortages, and a reduction in the number of daily meals prepared during the approaching pre-harvest hungry period (House, 1991: 871). It was also observed that in the poorest one-half of the households, over 40 percent of the children were stunted, were under 90 percent of the standard length for age, and were much less likely to have been vaccinated against such diseases as polio, measles and diptheria (House, 1991:871). These households' income sources were indicated to have a pattern of heavy reliance on crop production and low productivity off-farm sources to supplement subsistence food crops. This impact of income levels on food welfare is substantiated by a finding in Kenya where higher income male-headed households were able to achieve 94 percent caloric adequacy while their poorer female-headed counterparts attained only 89 percent (Kennedy and Peters, 1992:1080). Irrespective of household headship, household income and morbidity patterns among children do not appear to be significantly related in localities studied in The Gambia, Kenya, Malawi, Rwanda, and Guatemala, and the Philippines (Kennedy, 1994:87).

Focusing on forms of income and how these affect food consumption and nutritional levels, cash crop income for households in selected study areas of Rwanda, Zambia, and Malawi increased per capita calorie consumption (Bouis, 1994:68-69) and such increments from this source did not have a significant negative effect on children's nutrition (von Braun,

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[6] The concept of equivalence scale has also been employed in calculating an index of available household labor as well as in measuring household consumption units (Leonard et al., 1994:115; Trairatvorakul, 1984:49). It has been used in order to make the variable being analyzed sensitive to household composition and to the differential utilization of resources by different household members (Haddad et al., 1995:8).

1994:43). In a similar vein, a study in Papua New Guinea showed that the amount of income from cash crops served as the most consistent predictor of anthropometric status (height-for-age, weight-for-age, and arm circumference) and energy intakes among children (Shack et al., 1990:65). Contrary findings, however, were evident among households in northern Mozambique in that cash income obtained from cash cropping or from off-farm work had little effect on a household's consumption position (Tschirley and Weber, 1994:168). It would appear from these analyses that own calorie production is more critical to ensuring food availability and intake within the household.

There actually are differing assertions regarding the impact of off-farm income on household welfare. In the Sahelian and Sudanian areas of Burkina Faso, local and non-local off-farm income make up a substantial share (about one-half) of the total household cash and non-cash receipts in order to ensure food purchases and consumption security (Reardon et al., 1988:1070-1071). The situation has been attributed to pronounced climatic variability and uncertainties over production outcomes. In southern Sudan, wage employment income contributes an insignificant share to total income of the poorest households even as the latter spend considerable time and effort on these income sources (House, 1991:874-875). It has been suggested that these households tend to concentrate in marginal, low-income off-farm activities, hence, the insignificant impact of their earnings on their welfare. An insight that a separate study in Zona de Mata, Brazil also offers in this regard is that households that were more dependent on off-farm sources for their income were more likely to be malnourished than the other households that were included in the study (von Braun and Pandya-Lorch, 1992:42). Woodhouse (1992:186) contends that the effect of non-farm income is shaped by class. Specifically, wealthier individuals able to engage in earning activities are likely to earn, and hence be able to remit, more income than poorer individuals working as laborers (Woodhouse, 1992:186).

The role of remittances *vis a vis* household food welfare particularly as an important component of off-farm income is another area on which investigations have been made. More specifically, remittances were found to have less impact on food consumption and nutritional status as a consequence of its irregularity and inadequacy, as a result of a spending

pattern towards more expensive calories, or on account of lack of women's control over these cash receipts (Mazonde, 1995:85; Huss-Ashmore and Curry, 1994:108; Francis and Hoddinott, 1993:140; Kennnedy and Peters, 1992:1081; Sharp and Spiegel, 1990:543; Kaiser and Dewey, 1991:160; Wisner, 1989:443). This would appear to be reflected in the Transvaal and Eastern Cape regions of South Africa in that households that depended on remittances only spent relatively less of their income on food than those who had pension only or occasional income only (D'Souza et al., 1987:13, 18). While this study did not analyze these households' nutritional status in relation to their forms of income, an investigation in Malawi suggests that the receipt of remittances is an important factor in the higher pre-schooler undernutrition particularly in migrant female-headed household groups (Kennedy and Peters, 1992:1082; Kennedy and Haddad, 1994:689). This would seem to be the case as well in Guanajato, Mexico, where it was found that the proportion of income from the irregular migrant remittances was negatively associated with pre-schoolers' weight-for-age anthropometric status (Kaiser and Dewey, 1991:160). In this regard, an observation that has been advanced based on case studies in Botswana is that household members can be more assured of food if they can secure some contract with the migrant by taking care of the latter's affairs at home (Mazonde, 1995:85).

Non-cash incomes in the form of food aid (i.e., food transfer, food subsidy, or food-for-work programs) appear to condition household food welfare as well. While this may be thought of as comprising only a fraction of consumption, the reality is that its share can be as much as 57 percent (Reardon et al., 1988:1071) or it can be the only means of survival for households (D'Souza et al., 1987:17). There appear to be few analyses of how these forms of income affect consumption and nutritional status. The findings of D'Souza et al (1987:17-19), however, suggest that lower overall malnutrition rates among children in the Eastern and Northern Capes of South Africa appear to stem from the food rations that the households received from the government. Food subsidy, on the other hand, demonstrates a similar impact in that it was noted to have a positive and significant effect on the caloric adequacy ratio and weight-for-height anthropometric status of pre-schoolers in selected areas of the Philippines (Senauer and Garcia, 1991:383). Food-for-work schemes appear to have the

same positive effect on consumption in that participants to the program in a study site in rural Kenya had higher levels of caloric intake than those who were non-participants (Athanasios et al., 1994:306).

Household income in relation to food adequacy and nutritional well-being has been also examined through household expenditures, its indirect measure (Kumar, 1989:10; Haddad et al., 1995:8). The methodological bias for this indicator stems from the fact that income is one of the more sensitive and an extremely difficult-to-measure issue in social science research (Kumar, 1989:11). In this regard, household income data have been said to be "usually not reliable and valid and thus are of limited value" (Kumar, 1989:11). Employing total expenditure instead of measured income, on the other hand, "makes it easier to put a value on subsistence activities, at least to the extent that total expenditure is a realistic measure of 'permanent income'" (Haddad et al., 1995:8).

A major focus of studies on household expenditures and well-being has been on income allocations for food, said to range from 50 to 80 percent of a household's total budget (Behrman, 1995:11; Bouis, 1994:71; Tschirley and Weber, 1994:164). Interestingly, the proportion of income that goes into food may or may not impact on food intake and/or nutritional status. Its lack of such impact, for instance, was seen in Guanajato, Mexico where percentage of earnings that went to food was not significantly related to five anthropometric indices of children (i.e., weight-for-age, height-for-age, weight-for-height, triceps skinfold, and arm circumference) (Kaiser and Dewey, 1991:155). It was likewise observed that the proportion of food budget allocated to traditional food items (i.e., maize, beans, chile) was inversely related to the consumption of perceived 'luxury' foods (e.g., milk, meat, fruits, vegetables) and of processed foods (e.g., snack foods) (Kaiser and Dewey, 1991:135-136). These observations are contradicted by other studies, however. In coastal Ecuador, the pattern appeared to be one of a positive association between increasing per capita food expenditure and improvement in children's growth status, particularly in terms of height-for-age, weight-for-age, and arm circumference measures (Leonard et al., 1994:121). This was the situation also in the western highlands of Guatemala where for every quetzal increase in

monthly per capita food expenditure, the risk that the pre-schoolers' food intake was energy deficient was reduced by one percent (Immink and Alarcon, 1991:296).

Similar analyses of income allocations on health care – either in the context of food security or in terms of its role in household members' health maintenance – appear to be quite limited. Investigations on this issue note, however, that expenditures for the prevention and cure of an illness or infection differ by income levels (Ettling et al., 1994:75-76; Zaidi, 1988:121; Loewenson, 1988:737). That is, poor individuals and households are less able to spend for their health compared to those that have better earning capacities. In a rural community in India, for example, average expenditures per visit to any type of private health practitioner were about 25 percent higher among 'high' caste than 'low' caste individuals (Parker, 1986:24). Very low income households in Malawi, on the other hand, annually spent $0.59 on low-cost measures (e.g., mosquito coils) to prevent malaria while low to high income households incurred a yearly amount of $4.70 on items such as aerosol sprays and mosquito repellents to avoid such illness (Ettling et al., 1994:75-76). The total direct treatment costs[7] seem to be a consequence of amounts invested for prevention in that the former and the latter spent 28 and 2 percent, respectively, of their mean annual household income on treatment items such as traditional healer, health center, hospital admission or drugs from non-health center source (Ettling et al., 1994:76-77). In Burkina Faso, illness-related expenditures represented 6.2 percent of annual household expenditure and 3.7 percent of annual household income (Sauerborn et al., 1995:58). Among an agricultural working class in Zimbabwe, high opportunity cost of health care (in terms of lost piece work earnings in periods of high employment) implied opting for the more accessible fee paying facility where transport and waiting time is lower (Loewenson, 1988:737). Free state health care

[7] Direct costs in this Malawian study was defined as including annual out-of-pocket household expenditures on preventive methods; out-of-pocket expenditure per case (adult and child) on treatment of malaria at a health facility; and out-of-pocket expenditure on hospitalization per episode of malaria. It is contrasted with indirect costs which were analyzed in terms of value of time lost either due to individual's own illness or to caring for ill children. Factoring in of indirect costs yielded consistent findings of higher spending patterns for low to high income households than very low income households (Ettling et al., 1994:78).

facilities, where available, appears to be an important factor that also partly shape households' health expenditure patterns (Loewenson, 1988:737; Parker, 1986:24).

Another critical issue *vis-a-vis* household income and food security is the effect of increased earnings on consumption or on health and nutritional status. Analyses in this regard have shown that at higher levels of income, money is spent either on more expensive calories – a large proportion of which may not accrue to children – or on non-food luxury goods (Kennedy et al., 1994:118; Bouis, 1994:71; Kaiser and Dewey, 1991:148). The locus of control over household resources would appear to also be a consideration with income increments. That is, male-controlled income has been seen to translate less into food consumption than female-controlled amounts (Quisumbing et al., 1995:9; Huss-Ashmore and Curry, 1994:108; von Braun and Pandya-Lorch, 1992:46; Kaiser and Dewey, 1991:148). An explanation that has been offered on this issue is the differential spending preferences of men and women, the latter having been found to have expenditure patterns that are more child-, food-, and health-oriented (Haddad et al., 1995:14; Kennedy and Peters, 1992:1080-1081; Sharp and Spiegel, 1990:530-531; Parker, 1986:24).

Nutritional well-being

As with other measures of societal welfare, nutritional well-being and good health are concepts that defy simple definitions. This is because both are shaped by a number of factors (e.g., access to resources, food habits, intra-household distribution of food, maternal and child care practices, availability of health services, environmental aspects such as sanitation, housing, water supply) of which household food security forms an integral and immediate part (Vella, 1995:97; Haddad et al., 1995: 2; Kennedy, 1994: 99; von Braun et al., 1993: 4; Young, 1992:7; Maxwell and Smith, 1992: 24-25; Kumar, 1989:25; Jonsson, 1988:33). That is, both are viewed as consequences of food availability or access to food and adequacy of food intakes. At the same time, the relationship between these two measures is cyclical: a shortfall in level of food intake results in malnutrition as well as infection and/or disease; disease can depress appetites and lower food intakes as well as food absorption efficiency (Kennedy, 1994:99; Young, 1992:5; Foster, 1992:19; Pryer and Crook, 1988:7-14; FAO, 1985:18-19).

Assessments of nutritional well-being in relation to food security is generally undertaken in terms of nutritional status indicators, the most common of which employs anthropometric data (i.e., height, weight, and age) particularly among children age 1-7 years (Frankenberger, 1992:98-99; Ashworth and Dowler, 1991:122; O'Brien-Place and Frankenberger, 1988:21-22; Dibley et al., 1987:749). The choice of this population group stems from the fact that pre-school children are most vulnerable to malnutrition and that it is among them that the effects of changing levels of food consumption are most quickly discerned (Senauer and Garcia, 1991:371; Beaton et al., 1990:5-6; Kumar, 1989:23). At the same time, difficulties in establishing satisfactory reference standards for adults have inhibited the assessment of anthropometric status among older population groups (FAO, 1985:24).

The three anthropometric indices frequently analyzed for child malnutrition are weight-for-age (W/A), weight-for-height (W/H), and height-for-age (H/A). The weight-for-age data is an indicator of protein-energy malnutrition (PEM)[8] and of whether or not a child is presently well-nourished for his/her age (Chipika, 1994:13; Pinstrup-Andersen et al., 1993:391; Foster, 1992:16-17). This measure, in effect, signifies that a child is underweight if there is a deficit in his/her total body mass (Ashworth and Dowler, 1991:122; Beaton et al., 1990:2). The weight-for-height measure, on the other hand, assesses the incidence of wasting (thinness) and acute PEM which result from severe inadequacy in energy intake because of illness, poor weaning practices, or food shortage (Ashworth and Dowler, 1991:122; Beaton et al., 1990:2; FAO, 1990:151). Finally, the height-for-age parameter indexes a condition called stunting (shortness) that arises from retarded linear growth, suggesting nutritional inadequacy over a period of years (Ashworth and Dowler, 1991:122; Beaton et al., 1990:2; FAO, 1990:152). The importance of age for these measures lies in the fact that causes of growth failure are generally age-specific, and the required interventions often depend on age (Beaton et al., 1990:5). Gender comparisons among children on these measures are also made

[8] Protein-energy malnutrition (or protein calorie malnutrition) is the technical term for lack of calories or protein necessary for normal growth, body maintenance, and energy necessary for ordinary human activities. The condition, in extreme form, manifests itself as the potentially fatal nutritional disorders known as marasmus or kwashiorkor (Foster, 1992:16-17).

inasmuch as in some cultures, a male child is valued much more (in terms of their potential economic contribution to the household) than a female and, as such, have been said to be favored more in terms of food allocations within the household (Quisumbing et al., 1995:14; Zaidi, 1988:121).

Determining the above forms of malnutrition in children (i.e., underweight, wasting, and stunting) involves comparing the W/A, W/H, and H/A measurements against an international or country-specific reference growth patterns (Ashworth and Dowler, 1991:122; Beaton et al., 1990:13; Dibley et al., 1987:749). Cut-off points are expressed either as a percentile or as a percentage of the median standard or as a standard deviation score (Z-score) such that measurements that fall below the established thresholds indicate malnutrition in varying forms (Vella, 1995:90; Ashworth and Dowler, 1991:122). Of these three 'approaches', the Z-score method has gained the widest application in as much as it employs the same cut-off point for all three anthropometric indices (Vella, 1995:90). That is, it specifies a cut-off point of 2 standard deviations below the median of the reference population. Measurements that go beyond this point are considered as falling within the region where there is a high probability of one being malnourished (Vella, 1995:90).

A point worth noting about anthropometric information is that it is an indicator of food insecurity after the fact (von Braun et al., 1992:7; Frankenberger, 1992:9). And, while it shows the effect of food consumption and other factors on nutritional status, it has been said to provide less exact information on the impact of food consumption since nutritional status also results from other factors (Frankenberger, 1992:98; Kumar, 1989:23). The absence of correlation between household food security and nutritional status (the latter having been measured in terms of anthropometric data) in a number of cases (Gwanfogbe, 1994:132; Staatz and Sundberg, 1990:1315-1316) appears to support this limitation of anthropometric information *vis a vis* food consumption.

Interrelations among Issues

Access to food is a development issue that, in recent years, has gained prominence in social development research. The incidence of one's lack of access to this essential good is

itself not a new phenomenon. Yet, how sectors of population groups in developing countries cope continues to be a source of inquiry because of the insights they offer on changing micro-level responses and dynamics *vis a vis* contractions in opportunities for food security and, more broadly, for one's well-being. In a sense, thus, the continuing analyses on the issue are occasions to affirm the validity of sociological variables as well as of related formulations (e.g., food entitlement approach) in specific contexts, and to discover patterns that are distinct to different societies.

The basic argument of the proposed study is that a household's access to food shapes its health and nutritional well-being. Access is defined in terms of household structure and characteristics as well as the survival strategies that the household develops, with both sets of variables being seen as recursively shaping each other. Both are viewed also as influencing the income or food expenditure patterns of the household while at the same time directly contributing to the unit's health and nutritional well-being. Household income or food expenditure patterns orient health and nutritional well-being for the purchasing power that it affords households and, thus, their ability to obtain adequate quality and quantities of food.

Household structure and characteristics are pivotal to the household's survival strategies, income patterns, and health and nutritional well-being because they serve as the household's 'building blocks' or initial socioeconomic endowments. More specifically, this set of variables establishes what a household has to start and work with in addressing its food and other essential needs. The question, for example, of who heads the household – in terms of gender, age, and education – is a central issue since the key elements to food entitlements such as access to resources and labor employment, wage rates, control over household income and distribution of food resources, as well as the performance of domestic functions, continue to be gender-based (Quisumbing et al., 1995:2-11). While it has been asserted that the relationship between household income and gender of household head is mediated by whether the female-headed household is of *de facto* or *de jure* type (Kennedy et al., 1994:112-114), gender bias remains a reality for many female-headed households in developing countries and becomes manifest in their low-income survival strategies.

Fortunately, this has not always translated into poor nutritional levels among these households' pre-schoolers (Kennedy et al., 1994:115-120).

In addition to household headship, the factors of household size, availability of household labor resources, dependency rates, and educational levels of adult members are critical considerations in the shaping of household's survival strategies, income patterns, as well as health and nutritional well-being. The dynamics for large households are necessarily different from medium- or small-sized ones. What has been discerned in the literature is that larger/extended households, compared to smaller/nuclear ones, are more likely to be associated with greater diversification of assets, income sources, and crop cultivation and are less vulnerable to illness or death of breadwinners (Haddad et al., 1991 as cited in Frankenberger, 1992:130). Such diversification strategies have been found to result in higher income, and as income per adult increases, the household's relative welfare appears to improve (House, 1991:871, 882). Formal wage employment, as a consequence of higher formal educational levels among adult members and as part of a diversified structure of income sources, enhances income levels as well (Bigsten and Kayizzi-Mugerwa; 1995:200-201). Large households with high income can have positive effects on pre-schoolers' nutritional status, further suggesting that household labor may be less restricted, thereby allowing for more child care and adequate feeding (Kigutha et al., 1995:699; Immink and Alarcon, 1991:296).

Access to land and other physical assets also pattern households' food security and labor allocation efforts in income source diversification. Having land enables households to grow their staples, use these for home consumption, and sell surpluses for some cash or in-kind income. This production activity, however, may be affected by the availability of household labor. Specifically, a low per adult equivalent labor resource may be a constraint for meeting the family's food and other needs such that off-farm activities may have to be resorted to while less labor intensive crops (e.g., cassava, maize) are produced for home consumption (House, 1991:875). At the same time, labor constraints have been overcome by hiring labor or exchanging one's own with other households'. Such a practice may be critical if the household engages in the more labor intensive cash crop cultivation. The demands of

producing crops for sale will be less of a problem, however, if households do not have access to land or if land is unproductive and support services for this endeavor are absent as has been the case in South Africa. The options then for such households are less farm-oriented and are more likely to be labor-based which, in turn, manifests in labor migration, local off-farm or informal activities. The health and nutritional effects of these strategies that build on assets and/or labor vary and depend to a large extent on how these are reflected in actual household income or household expenditures for food, nutrition, and health needs.

Summing up, the health and nutritional well-being of a household's members appears to be determined by factors that are closely inter-connected with one another. What also seems clear is that food and nutritional entitlement is more than the sum of access to physical assets given that socio-demographic attributes of the household are likely to interact with the utilization of such assets as well as with the allocation of income and food resources that the household can generate.

Implications for Research

Sociological analysis of households' health and nutritional welfare implies the need to look into the ways and means by which households build upon their internal resources to make a living and gain access to food. The resultant diversity of their survival strategies – asset- and/or labor-based – also suggests the need to explore how these have been applied and made workable for attaining a level of health and nutritional well-being in the specific contexts of rural and urban South Africa. This research will attempt to make such an analysis of South African households with particular emphasis on how their unique household structures and characteristics serve as bases for income generation, food accession, and survival.

Conceptual Model

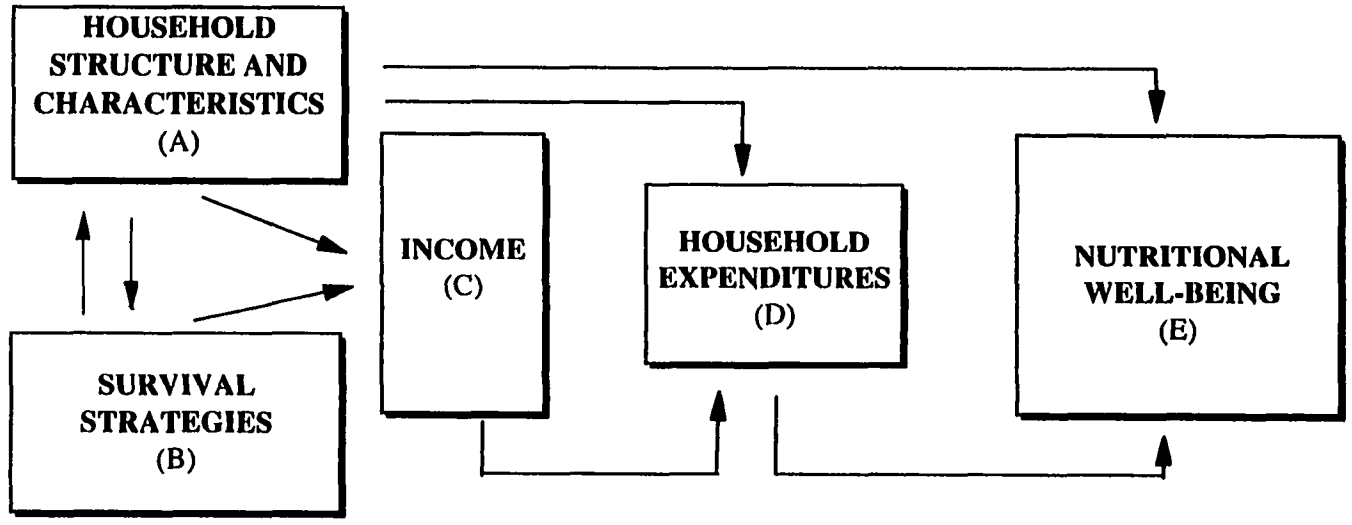
The dynamics of household survival for food security is one that is complex and multi-faceted. To a large extent, however, it is shaped by macro- and micro-level forces

and/or by a range of situational contexts that have served, at one and the same time, as opportunities and constraints for achieving a level of well-being. The kinds of strategies that have evolved, necessarily, have been as much a product of the characteristics, resources, and initiatives of an individual as a household member (specifically, the household head) as of the household as an assumed collectivity. To the extent that some measure of purchasing power is obtained, the outcomes of these strategies and the allocation of the benefits derived therefrom can be hypothesized to be a degree of relative security over food availability and intake, as well as adequate nutritional levels.

Figure 1 attempts to capture some key aspects to understanding the dynamics of food security at the household level. It contends, in essence, that household structure and characteristics (A) shape income-earning survival strategies (B). This set of variables also directly impinge on income and household expenditures (C and D) and on the household members' nutritional well-being (E). Survival strategies are methods of attaining income and engender the household's entitlements to food as assets (land holding, livestock) and the household labor resource are harnessed and/or allocated for specific food- or income-earning activities. Household income and expenditure patterns mediate the impact of household structure and characteristics as well as of survival strategies and, at the same time, directly determine health and nutritional status. However, the extent to which adequate levels of nutrition are achieved may depend on how much purchasing power is attained, the forms of income that is received, and the kind of food spending that the household makes. The direct and indirect effects of the independent variables (A and B) are expected to be observed in household members' caloric and food variety intake, and in child-level anthropometric status. Figure 2 spells out the specific data analytical framework that the study will undertake.

Theoretical Perspective

Two theoretical paradigms orient the design and analysis of the proposed research: the political economy perspective as elaborated in Sen's (1981) entitlement approach to food security, and Giddens' structuration theory which can offer an explanation for how



(A) Household Structure and Characteristics

Household Structure and Characteristics: Gender, age, education of household head, household size, labor power, dependency ratio, education of non-head adults

Access-to-Resource Attributes: Assets (land, animals, equipment, tools), type of access to land, size of land holdings, number of livestock holdings, number of crops grown

(C) Income

Cash and non-cash, agricultural, formal/informal sector wages remittances, pensions, other transfers

(D) Household Expenditures

Food, health, education, transportation, rent, others

(E) Nutritional Well-being

Food consumption patterns : food variety scores, caloric intake

Child-level anthropometric measures: height-for age, weight-for-age, weight-for- height

(B) Survival Strategies

Production resource/asset-based strategies: Use of land, number of crops, diversity of farm enterprises, sale of agricultural products

Farm and off-farm, formal or informal sector employment and other cash- and food-earning strategies

[*Alternative Strategies:* Food rationing, reducing household size, claims and other forms of reciprocity]

Figure 1. Conceptual Framework.

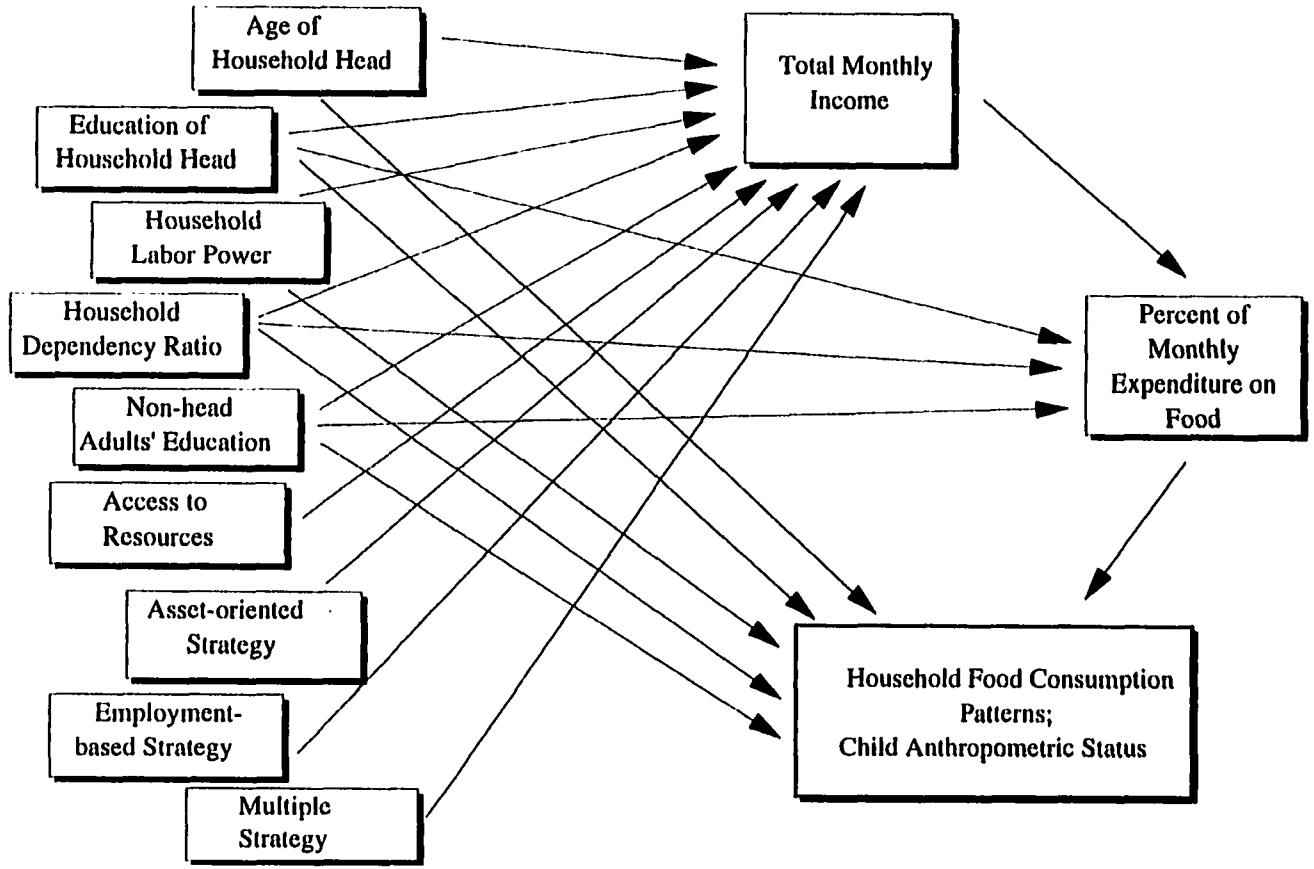


Figure 2. Data analytic framework (female- and male-headed households): Direct and indirect effects of household characteristics, survival strategies, income, and household food expenditures on food consumption patterns and child anthropometric status.

households' survival or livelihood strategies and (internal and external) social relations are shaped and reproduced, across time and space, against their specific socioeconomic contexts.

The political economy perspective views development in general, and micro-level social relations in particular, as arising out of domestic political-economic histories and international economic and political conjunctures (Evans and Stephens, 1988:746). Social differentiation has been an ineluctable outcome of these processes such that differential access to resources pattern societal groups' capacities to respond to their context-specific socioeconomic (including food) constraints (Thomas et al., 1989:42). This asymmetry is not confined to class or socioeconomic group but can also encompass such concerns as ethnicity and gender (Thomas et al., 1989:42).

It is around the issue of access that the approach to food entitlement has been developed. Briefly, the perspective contends that "a person..starves because he does not have the ability to command food" (Sen, 1981:45). One's food 'acquirement' status is determined by his/her entitlements or "the set of alternative bundles of commodities over which a person can establish command" (Sen, 1981:45; Sen, 1990:34; Sen, 1993:30). A requisite to these entitlements is one's endowments which are the person's original bundle of ownership or all the resources over which (s)he may have control such as land, labor, savings, and livestock holdings that enable him/her to procure food. The concept of entitlement mapping, or the various ways (e.g., production, trade, wage labor) by which one's resources are converted (mapped) into alternative bundles of goods and services, relates the endowment set to the entitlement set (Sen, 1981:45; Tabatabai, 1995:34). One experiences entitlement failure (or food insecurity) when (s)he does not have access to resources, has inadequate income due to low wages, or when his/her returns from farming are too low in relation to food prices (Swift, 1989:9; Sen, 1981:46-48). In the tradition of the paradigm it represents, the approach suggests that food insecurity be analyzed in terms of causal influences that make population sub-groups' entitlements fall short of their minimal food requirements (Sen, 1993:30).

While the political economy perspective offers an orientation for uncovering, interpreting, and explaining patterns of social relations (Evans and Stephens, 1988:746; Campbell et al., 1991:75), Giddens' structuration theory advances a view that permits a

deeper and far-reaching conception of household survival strategies. Anchored on the analysis of recurrent social practices (Giddens, 1989:252), the theory views social structure[9] as an intimate element in the production of human action. The relationship, more specifically, is one of mutual dependency or a duality and dialectical interplay of human agency (i.e., individual human actors or collectivities who, intentionally or unintentionally, produce social acts) and structure (i.e., the norms as well as the material and non-material resources that said actors or collectivities invoke in the production of action) (Giddens, 1984:25; Bernstein, 1989:23). Stated differently, structure "is both the medium and the outcome of the conduct that it recursively organizes – a medium because it is through its use [by the human agency] that social conduct is produced, and an outcome because it is through the production of this conduct that 'rules' and resources are reproduced in time and space" (Mouzelis, 1989:615). The theory offers an approach, on the one hand, for rethinking survival strategies as recurrent social practices that reproduce existing social relations and, on the other, for reconceptualizing the household as a unit of analysis – and as a locus of survival strategies – particularly in relation to the conventional assumptions of coresidence, commensality, and of resource pooling and sharing. It does these by suggesting that livelihood mechanisms or survival strategies are determined, to a large extent, by the resources that are available to a household (e.g., the individuals that make up these units, the physical artifacts to which they have access such as landholdings), the prevailing pattern of (internal) social relations, and the opportunities and constraints (i.e., the broader 'rules' and resources governing the household's external social relations) that the larger society affords each household and its constituents. Depending on the extent to which these conditions permit the production of appropriate action, corresponding survival strategies are evolved, an inherent part of these being the shaping and reshaping of the unit's form and operation as it reproduces existing and emergent ideologies (e.g., those based on gender, age, education, and on the informalization of economic activities) that underlie food- and income-earning. It is in

[9] Structure, for Giddens (1984:17-21, 23), is made up of 'rules' or procedures that human actors 'call upon' in the production/reproduction of their actions, and of material and non-material resources (e.g., land, power) over which actors or collectivities exercise control.

this context that the theory assumes relevance for the study. That is, it suggests the need to examine the interplay of household resources in fashioning survival strategies, how these strategies impact on the household's form and operation, as well as how these strategies reproduce wider social relations such as those based on class, gender, age, and kinship. It also becomes a valuable approach for analyzing South African households given the structural (and spatial) transformations that these units have experienced through time as a consequence of the constraints placed on them particularly during the apartheid years.

Research Hypotheses

In light of the foregoing review of the key elements and correlates of household food security and the proposed conceptual model, a guiding hypothesis emerges: rural African households' nutritional well-being will be determined by the direct and indirect effects of, and potential interactions, among households' structure and characteristics, households' access-to-resource attributes, households' survival strategies, and households' income and expenditure patterns.

Household structure and characteristics will include household headship, composition, household size, labor power, dependency ratio, and adult members' educational levels. Ownership or usufruct status over arable land and draft animals constitute access-to-resource attributes. Asset-oriented, employment-based, or multidimensional strategies are the households' survival strategies that will be analyzed. The income variable consists of the varying forms of income that households receive, their income levels, and income allocations for food.

The specific hypotheses that will be examined are:

a. Households that have access to more socioeconomic resources are more likely to have multidimensional and higher income-earning survival strategies than households that have access to less socioeconomic resources. Access to socioeconomic resources is viewed to be a function of headship factors (gender, age, and education), and availability of a larger household labor resource, higher educational levels among adult members, and access to land and animal traction or farm animals.

b. Households that employ multidimensional and higher income-earning survival strategies are more likely to have higher caloric intake and greater dietary diversity, and to have children with lower levels of malnutrition than households utilizing strategies that are asset-oriented or employment-based only.
c. Households that have access to more socioeconomic resources are more likely to have higher calorie intake and greater dietary diversity, and to have children with lower levels of malnutrition, than households with less access to socioeconomic resources.

Appendix A provides a summary of these hypothesized relationships among the independent and dependent variables of the study.

CHAPTER 3 – METHODS OF DATA COLLECTION AND ANALYSIS

Unit of Analysis

The household is the unit of analysis upon which the conceptual and analytical framework is based. The relevance of this unit builds on a view that the household can be an important structural setting that links individuals and the larger society (Davidson, 1991:26), and that it is the locus of sets of relations where some resources are managed and claimed collectively, if not equitably (Evans, 1991:58). Cognizant of the impact of the prolonged economic organization of resources and labor under apartheid, the study further views and treats the household as being organized around a nuclear or an extended family system as well as being either male- or female-headed. The specific household attributes that are analyzed in relation to survival strategies and to nutritional well-being are: household structure and characteristics (specifically, gender, age, and education of the household head, household size, labor power, dependency ratio, and adult members' formal educational levels), and access-to-resources attributes such as usufruct or ownership of assets (land, livestock), type of access to assets, size of land, number of livestock holdings, number of household's crop enterprises, and household's food/non-food spending patterns.

Analyses are also made at the individual level. This is to assess the specific contribution of members' income- or food-earning activities towards the household's well-being. The particular areas on which analyses have been made are those that relate to employment (particularly to discern age- and gender-based labor allocation patterns), and to children's anthropometry.

Data Collection Methods

This study draws upon an existing data set gathered in September 1993 under the leadership of the South Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town. The purpose of the nationwide survey was to establish baseline household statistics throughout the country as well as to generate data inputs for

governmental development planning. Conducted among some 9,000 households, personal interview was the information gathering method employed. Actual field work was accomplished with the help of five professional research organizations that were based in Pretoria, Durban and Johannesburg. A process of verification was set in place to confirm the accuracy of the information being collected and to alert SALDRU to the weaknesses that the interview schedule may demonstrate (SALDRU, 1994:ii).

A comprehensive household questionnaire was the main instrument used for the survey. Its formulation drew upon similar studies in other countries that were assisted by the World Bank and was based upon the expertise of social scientists from around the country. Almost a full year of preparation and finalization resulted in an instrument that focused on the areas of demography, housing characteristics and living conditions, household food and non-food expenditures, educational status and expenditure, remittances and marital maintenance, land access and use, employment and income, health status and expenditure and anthropometry. Quantitative data was the overall output of this major activity (SALDRU, 1994:iii).

Because the objectives of the proposed research differ from those of the South African nationwide survey, only selected sets of information have been used. Specifically, the study analyzes those that focus on household structure and characteristics, access to and use of land resources, agricultural production, employment, income and income sources, food spending and consumption, non-food spending, health, and anthropometric data on children age six years old and younger.

Sampling

The selection of respondents for the 1993 nationwide survey (i.e., the basis of the proposed research) involved a two-stage self-weighting sampling design. The first stage units were Census Enumerator Sub-Districts (ESDs) and, in some of the former homelands, villages or village groups. The second stage units were the households (SALDRU, 1994:v).

Sampling of the area stage units (i.e., the ESDs and villages) was done with probability proportionate to size "to ensure that the racial and geographic breakdown

approximated the national population distribution" (SALDRU, 1994:vi). The process entailed preparing a listing of the ESDs by statistical region and within a statistical region, identifying the urban and rural areas. A list of the urban and rural ESDs (per statistical region) in order of percentage African was then obtained. Systematic sampling was subsequently made, the sampling interval being based on the quotient from dividing the 1991 population census by the 360 clusters to be selected. Where a selected ESD was deemed inaccessible (due to respondent refusals/absences or peace and order problems in some areas), replacements were taken.

Systematic sampling was likewise undertaken for the households, the second stage units. That is, a list of households in the selected ESDs was drawn up after which the sample households were systematically picked. The sampling interval at this second stage was computed by dividing the 1991 population census by 118.1, or the number of persons per cluster based on census data, allowing for growth in population since 1991.

The final household sample obtained from the above procedure and from adjustments in weights for each race group[10] represent approximately 0.1 percent of South African households. The breakdown by location and by racial grouping, as weighted by enumeration, is summarized below (SALDRU, 1994:14):

Table 1. Total sample of South African households by location and racial grouping (%).

Location	African	Colored	Indian	White	Total	Number
Rural	95.7	1.1	0.0	3.2	100	4,007,100
Urban	56.7	13.8	6.9	22.6	100	1,907,500
Metropolitan	45.0	13.5	3.6	37.9	100	2,616,200
ALL/ South Africa	71.4	7.7	2.7	18.2	100	8,530,800

[10] Due to some problems encountered during field work, weights had to be employed for each race group at the level of the provincial/homeland boundaries and race. The median weighting factor was about 900, with weights ranging from 824 to 1532 (Mazur, 1994).

Operational Measurement of Key Concepts

The concepts and terms being employed in this study have been used and analyzed in various contexts even as many of these focus on social processes and relations. For this reason, their explicit meaning and application are established as follows:

Household - a coresident group of individuals, regardless of their relationship by blood, affinity, or marriage, who had lived under the same roof for more than 15 days out of the last 30 days. The members (presumably equally) share food from a common source (i.e., cook and eat together), as well as contribute to or share in a common resource pool. This contribution or share may be derived from wages/salaries or other cash and in-kind income. The members such as the children and other non-economically active members may also be benefiting from said income but not contributing to it (SALDRU, 1994:iv).

Because households inherently differ in their structure and socio-demographic characteristics, different sample sizes are derived in analyses relating to a) survival strategies, b) income/household expenditures, and c) children's anthropometric status. The study focuses on rural African households of South Africa.

Household structure - refers to any one of the various forms that households assume (e.g., nuclear/extended, no family, male/female-headed) and for which the issues of composition, headship, and organization of domestic functions are central. In this study, household structure is being defined in terms of headship and composition. The specific headship variables are gender, age, and education while those of composition include household size, labor power, and dependency ratio.

Household head - is that member of the household who has control over most household income, assets, and decision-making, and performs the traditional role of provider for the family. The household head in this study is the person identified by the (interviewed) household member(s) based on their own understanding [or, the assumed meaning] of the concept.

Household size- the total number of individuals who, at the time of the survey, had lived within the same roof for at least 15 days within the last 30 days, regardless of relationship by blood, affinity, or marriage.

Adult household members - the individuals in a household whose ages range between 15 to 101 years and who are actual and potential food and income earners.

Educational levels - the actual years of formal education completed by male and female adult household members, including the household head.

Household labor power - an index of available household labor calculated as:

$$LP = 0.5P_{6\text{-}14} + 0.75P_{15\text{-}17} + 1P_{18\text{-}59} + 0.75P_{60 \text{ and older}}$$

where P = number of persons, and subscripts are age categories of household members (Leonard et al., 1994:115).

Dependency ratio - the ratio of the number of children less than 15 years old and the elderly who are 60 years and older resident in the household to the number of household members who are 15-59 years of age (i.e., those considered as belonging to the 'working age' population grouping).

Ownership/access to resources - refers to a household's lien/legal right or ability to exercise use over inputs for agricultural and food production, as well as income generation. These inputs or resources are land, livestock or farm animals (e.g., cattle, sheep, goats, pigs, poultry), farm equipment (e.g., tractors, water pumps), and non-mechanical farm tools (e.g., spades, hoes).

Access to resources in this study is a composite factor of a household's assets: level of access to land; size of land; number of crops; asset index or the number of vehicles, mechanical equipment and non-mechanical tools owned; cattle equivalent units of livestock holdings, and farm animal diversity.

Level of access to land - the graduated categories at which a household may have rights over crop and/or graze land. The categories created from the data set are: no access to land, communal access, combinations of different types of access (e.g., rents crop land but has communal access over graze land; has communal access to crop land but rents graze land, etc.).

Size of land holding - the total land area used in 1993 by a household for crop production, as expressed in hectares.

Number of crops grown - the actual number of different types of plant produce that a household cultivates, regardless of the crop variety groupings of starches, legumes, fruits, and vegetables.

Asset index - a summary measure representing the weighted sum of all vehicles, mechanized equipment, or non-mechanized implements that a household owns. The total is weighted since ownership of each item is associated with specific points (i.e., vehicles = 3, mechanized equipment = 2, non-mechanized tools = 1) to establish the distinct market values of these farm assets.

Cattle equivalent units - a measure of the value of livestock holdings owned by a household. This measure counts one head of cattle as one unit, as are 5 heads of sheep, goats, and pigs (May, 1987:5; D'Souza, 1987:5).

Farm animal diversity - the actual count of the different types of farm animals owned by a household. The use of this data has been based on four categories, namely: none/no access to farm animals, has one type of farm animal, has two to three types of farm animals, and has four to five types.

Type of access to resources - the nature of the relationship that a household has over agricultural/food production and income generation inputs. The relationships that this study specifies are: *cultivation/grazing rights* over communal land, as well as *ownership,*

and *lease/rental* of crop and/or graze land. In terms of other inputs, a household may *own* and *not own* livestock/farm animals, and may *own* or *not own* non-mechanized farm tools.

Survival strategies - the set of responses households take in order to reduce risks or uncertainties over food security and livelihoods and/or to adapt to changing socioeconomic conditions that adversely impact on the day-to-day existence of the household. In this study, the concept is used to refer to the short- and long-term activities in which a household engages to ensure the availability of food and of other necessary goods and services for its members. The two major foci are the asset or production resource-based strategies and employment strategies by the household.

Asset/production resource-based strategies - refer to those activities that primarily involve cultivation of crops or livestock husbandry, marketing or sale of assets and/or agricultural products (e.g., fruits, vegetables, animal products), the storage of farm produce (e.g., grains), and renting out of farm assets (e.g., land, farm animals). Crop cultivation strategy has been viewed also in terms of number of crop enterprises, type or mix of crops grown (e.g., food crops, cash crops), and actual use of land (i.e., proportions of land allocated for specific uses).

Asset-oriented strategy in this study is a composite measure of four indicators, namely: type of land use, extent of land use in 1993, diversity of farm enterprises, and number of agricultural products sold by the household.

Type of land use - the non-use, partial, or full use of the households' land resources either for crop production, animal grazing, or for both.

Extent of land use - the proportion of the household's crop land resources actually used in 1993. The specific response categories on this variable are: no access to land, none used, less than to about half, and more than half or all.

Diversity of farm enterprises - refers to the extent to which households diversify their agricultural production activities. This variable has four categories: no access to crop/

animal production, engaged in crop production only, engaged in animal production only, engaged in both crop and animal production.

Number of agricultural products sold - the actual number of the different types of crop and animal products (e.g., milk, eggs, animal skins and hides, or wool and mohair) sold by the household. This measure of asset-oriented strategies was grouped into: none/no access to crop or animal production, none sold, sold one to three plant and animal products, and sold four to eight plant and animal products.

Employment-based survival strategies - are the activities in which household labor is 'sold' in exchange for a wage or an in-kind payment. In general, participation in these economic activities may be a) on a part-time or full-time basis, b) on casual/temporary or permanent terms, and c) in the formal or informal sectors. Informal sector employment often includes off-farm wage (e.g., laborer, semi-skilled worker, casual wage earner) or self-employment forms of work.

Data limitations restrict the household level analysis of this concept as the number of adults employed per household. Because extremely few cases obtain in some response categories, the data has been grouped into: none of the adult members are employed, only one adult is employed, 2-3 adults are employed, and 4-7 adults are employed.

At the individual level, employment-based strategies are examined in terms of household members' age-, gender-, and education-based labor allocation patterns for regular and casual wage employment, agricultural self-employment, and other self-employment activities. The prevalence of labor migration among individual household members is also explored.

Multidimensional survival strategies - refers to the levels of livelihood mechanisms that households employ to attain adequate incomes and food. The variable has four categories: households with non-asset and non-employment strategies, those with asset strategy only, those with employment strategy only, and those with both asset and employment strategies.

Income - the total cash and in-kind (e.g., food, subsidized goods) inflows into a household as obtained from various possible sources, including those derived from either asset or employment-based strategies, or from both. This study builds upon the income sources specified and amounts derived by SALDRU based on the data of the 1993 survey. As defined by SALDRU (1994:312) and based on an examination of the data files on income, the income sources are:

- *Monthly receipts*, or the amounts of cash and in-kind remittances received in the last year by a household, as expressed on a per month basis;
- *Net wage income,* or the net cash earnings received from regular and casual wage employment;
- *Food subsidy,* or the food wages received from regular and cash wage employment;
- *Agricultural income,* or the amounts obtained from subsistence agriculture after deducting production costs. The net amount includes profits from sale of agricultural produce, value of crops used for home consumption, farm subsidies or drought relief, and income received from providing services to other farmers or from renting out equipment;
- *Profits from self-employment activities*, or the difference between gross sales and expenses of goods from home-based enterprises (e.g., shopkeeping, sewing and selling clothes). Where the business was running at a loss, profit was said to have been set to zero to obtain the household's long run income;
- *In-kind income*, or the Rand value of food gifts received by a household;
- *Other income*, or those earned from non-employment sources such as old age or civil servant pensions, and other transfers like disability grants, unemployment insurance, government poor relief and workmen's compensation;
- *Housing and travel subsidies*, or the total Rand equivalent of housing and transport benefits obtained from regular and casual wage employment.

While all these income sources form an important part of the discussions on household income, the key variable used in the multivariate analysis is the household's total monthly income. For descriptive purposes, summary measures such as per capita

income, per adult equivalent income and income allocations for food and non-food items (e.g., health and care, clothing) are examined. Households' income levels – in terms of per capita income quintiles – are also analyzed. The study excludes from the analysis eight households that had an agricultural income of equal to or greater than R20,000. Units attaining these agricultural income levels have been regarded by SALDRU to be engaged in large scale agriculture (SALDRU, 1994:312).

Household expenditures - refer to the monthly amounts spent by the household on food and other non-food items.

Food security - the sustained and assured access to enough food, in terms of quantity and quality, by all social groups, households, and individuals in order to meet nutritional needs. As applied in this research, it is the ability of households to secure specific amounts of food items to ensure and maintain certain levels of adequacy in their nutrition and health. Ability in this context is evaluated to be a function of household characteristics, as well as of income and food produced or earned from various survival strategies that households devise and/or employ. An outcome indicator of this concept – nutritional well-being – is the dependent variable of this study.

Nutritional well-being - a desired condition of body 'wellness' arising from sufficient intake of food with adequate nutrients. Food consumption patterns and household children's anthropometric status are two measures by which this concept is analyzed.

Food consumption patterns - can be defined as food availabilities, food purchases or expenditures, food eaten or nutritional status (O'Brien-Place and Frankenberger, 1988:3). The study refers to it as the daily calorie intakes and number of food items that entered the household (bought or eaten) in the previous week, as based on the respondents' recall. Its specific summary measures are:

- a *food variety score* of at least 15 (food items) over a time base of one week. This indicator of dietary adequacy has been made, conventionally, at the individual level. Because the data pertinent to this measure has been collected at the household level, the

study takes the assumption that food resources bought or eaten at the household level are shared equally within the unit. That is, each member eats the same type of food. The minimum number of 15 food items as applied to the individual, in other words, are assumed to hold as well for the household. Thus, a household is considered as having nutritional or dietary adequacy or having a good diet when 15 or more food items have been consumed by the household in the previous week.

Dietary diversity, dietary adequacy, and good diet are phrases used interchangeably to describe this minimum or more than the minimum variety of foods consumed by the households.

- *percent of the recommended caloric intake*, established to be 80%. This recommended threshold has been said to also approximate 1.5 times the Basal Metabolic Rate (BMR), the widely assumed maintenance requirement for an average individual (von Braun and Pandya-Lorch, 1992:51).

  Household caloric intake evaluated in relation to the recommended energy allowances is expressed on a per adult equivalent basis. That is, total calories obtained at the household level is divided by the total number of household members, expressed as adult equivalents (with adult males as the reference person). The standard against which the attained household caloric intake is compared is the U.S. recommended energy allowances of 2900 kcal per day for adult males. This U.S. norm is being used upon the advice of South Africa's Department of Health[11].

Household children's anthropometric status - refers to the extent to which children 6 years old and below in the sample households fall within the growth pattern of a reference population, said pattern being based on height, weight, and age of this population group or household members. This study examines children age 2-6 years. A focus on this cohort, according to Beaton et al. (1990:14), generates a more relevant analysis if anthropometric measures are being used as proxy for generalized deprivation and poverty.

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[11] Communication from Dr. O. Shisana, Director-General of South Africa's Department of Health, to Dr. R. E. Mazur, 11 March 1996.

The specific indicators that are studied are the anthropometric parameters of *weight-for-height* (W/H) which determines the incidence of wasting among children; *height-for-age* (H/A) which measures stunting problems, and *weight-for age* (W/A) which assesses whether children are underweight.

The study employs the Z-score method for establishing the forms of malnutrition that exist. This method specifies a cut-off point of 2 standard deviations below the median of the US National Center for Health Statistics (NCHS) reference population[12]. The z-scores in the reference population has a normal distribution with a mean (and median) of zero and a standard deviation of 1.

Analysis Procedures

Scaling techniques for data reduction purposes, bivariate correlations, cross-tabulations, comparisons of means through t-tests and analysis of variance (ANOVA), and path analysis for directly observed variables in LISREL 7 (Jöreskog, and Sörbom, 1989:119-123) are the analytical methods that are utilized in this study. Tests for violation in the assumptions of path analysis – mainly through residual plots – have been also undertaken. Enumeration weights are applied to the univariate, bivariate, and multivariate analyses that have been made[13]. Data processing and testing of the hypothesized relationships among the variables have been largely done in SPSS for Windows. Anthropometric analysis, however, entailed the use of EPINUT, an anthropometry program within Epi Info Version 6. Epi Info Version 6 is a DOS-based software developed by the Center for Disease Prevention (CDC) in

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[12] The use of growth data for children in developed countries as norms for developing countries has been said to be justified. According to the literature, in comparisons of well-nourished pre-school children from diverse ethnic groups, the anthropometric differences are quite small, especially compared to the very large differences within ethnic groups between malnourished and well-nourished children (Senauer and Garcia, 1991:327; Beaton et al., 1990:46). South Africa's Department of Health confirms also that anthropometric assessment of infants and young children in the country employs the NCHS growth standards (Communication from Dr. O. Shisana, Director-General of South Africa's Department of Health, to Dr. R. E. Mazur, 11 March 1996).

[13] The enumeration weights applied to all analyses were re-adjusted ones. That is, the original enumeration weights of 847-1321were further divided by 1000 to reduce the resulting magnification of n's, and to avoid the occurrence of all variables being significantly correlated with one another.

Georgia and the World Health Organization (WHO) for word processing, data base, and statistics work in public health.

Preliminary analytical procedures conducted among the variables are described below.

Household characteristics and survival strategies

Of the approximate total of 9,000 households covered by the SALDRU-led survey in 1993, data on 4212 rural households of African racial grouping were selected for analysis. Existing variables in the household- and individual-level data sets were built upon when found relevant to the objectives of the study while additional needed ones had to be created. Original data files on agricultural production, food spending and consumption, as well as on children's anthropometry were cleaned and processed to formulate the measures of the concepts being studied. Table 2 presents the list of variables used in the study.

As will be noted in the table, the overall count of variables comprising the categories of household characteristics and asset-oriented strategies are 12 and 4, respectively. To reduce these numbers and for data management reasons, composite measures of conceptually related indicators were developed. These indicators were each scaled into four response categories to address the problem of varying units of measurement, and were then subjected to reliability analysis.

Of the three composite measures that were to be created, only access to resources and asset-oriented strategy showed parameters that generated fairly reliability coefficients based on the split-half method (Table 3). Scaled items for the former had a reliability coefficient of .7337 while the latter had .9673 using equal-length Spearman-Brown estimates[14]. Appendix B has the categorized indicators of these two composite measures.

[14] Interpretation of the parameter estimates on these two composite variables, however, should be made with care. This is because each composite measure is being based on four-category indicators which, when summed and analyzed based on a product moment correlation, can result in underestimated parameters with overestimated standard errors as suggested by Babakus et al. (1987:222-228)

Table 2. List of household-level variables.

Variable name	Description	Level of Measurement
Household Characteristics		
GENRHDI	Gender of household head	Ordinal
AGE	Age of household head	Interval
HHDSEDUC	Education of household head	Interval
LBRPWR	Index of household's labor power	Interval
DEPRATIO	Dependency ratio	Interval
MNEDUC	Non-head adults' mean education	Interval
LAND	Levels of access to land	Ordinal
CROP-SIZE	Size of landholding (in hectares)	Interval
CTLEQV	Cattle equivalent units of small (bovine) stock	Interval
ANMLDV	Farm animal diversity	Ordinal
ASSTNDX	Index of vehicle, mechanical equipment, non-mechanical tool ownership	Interval
NUMCROP	Number of crops grown	Ordinal
Survival Strategies		
FRMDVRST	Diversity of farm enterprises	Ordinal
LANDUSE	Type of land use	Ordinal
CROPUSE	Crop land used in 1993	Ordinal
NAGPRDCE	Number of agricultural products sold	Ordinal
NEMPLYD	Number of household adults employed	Ordinal
MLTSTRTG	Multi-dimensional strategy	Ordinal
Income and Expenditure		
TOTMINCI	Total monthly household income	Interval
PMXFD	Percent of monthly expenditure on food	Interval
Food Security and Nutritional Well-being		
AEQCALI	Daily caloric intake per adult equivalent	Interval
NUFDITMS	Number of food items consumed in the past week	Interval
W/H	Weight-for-height anthropometric status	Interval
H/A	Height-for-age anthropometric status	Interval
W/A	Weight-for-age anthropometric status	Interval

Table 3. Reliability coefficients of indicators on composite variables.

Variables	Alpha, if Item is Deleted
Access to Resources (HHRSRCE2)	
Levels of access to land	.8198
Size of landholding	.8203
Number of crops grown	.8495
Index of farm asset ownership	.8411
Cattle equivalent units	.8266
Farm animal diversity	.8179

Reliability coefficients: 6 items			
Correlation between forms	= .5794	Equal-length Spearman-Brown	= .7337
Guttman Split-half	= .7330	Unequal length Spearman-Brown	= .7337
Alpha for part 1	= .8183	Alpha for part 2	= .8180
(3 items in part 1)		(3 items in part 2)	

Asset-oriented Strategy (STRTGY1)	
Type of land use	.8351
Extent of land use in 1993	.8072
Farm diversity	.7847
Number of agricultural products sold	.8602

Reliability coefficients: 4 items			
Correlation between forms	= .9367	Equal-length Spearman-Brown	= .9673
Guttman Split-half	= .9516	Unequal length Spearman-Brown	= .9673
Alpha for part 1	= .6883	Alpha for part 2	= .6012
(2 items in part 1)		(2 items in part 2)	

The original interval-level values rather than those of the grouped data, where applicable, are used in the comparisons of means analyses. In bivariate analysis and model estimation, ordinal-categorical data (specifically, employment-based strategy and multiple strategy) are treated as if these are interval level measurements. Selection of the final independent variables – households characteristics, in particular – for inclusion in model estimation is based on their conceptual importance in shaping outcomes in the dependent ones, as well as on the magnitude of their bivariate relationships. Thus, while labor power and non-head adults' education do not form a composite index of household 'manpower' resources, these have been treated as single indicators for the hypothesized positive contributions these have on food consumption patterns and child anthropometric status.

Analysis of food consumption patterns

As noted earlier, food consumption patterns have two measures: number of food items bought/eaten in the past week, and daily calorie intake per adult equivalent. Data on both were derived from households' reported monthly or weekly purchases of any or all of the food items in the list of 28 different types of food provided in the questionnaire. Foods received as gifts, as were those consumed from own production, were not added as additional food items. This is because both items were considered as income and as such were included in the calculation of the households' total monthly earnings (SALDRU, 1994: 312).

Number of food items. Examining the linearity assumption on this dependent variable with individual household characteristics and survival strategies generally resulted in plots depicting nonmonotonic linear relationships[15]. Linear transformation of the measure, thus, was undertaken by taking the natural logarithm of the sum of the actual number of food items reported by a household and a constant of 1. The specific formula was:

[15] Vogt (1993:142-143, 154) defines a nonmonotonic linear relation as one "in which increases (or decreases) in one variable are always accompanied by increases (or decreases) in another, but the changes are not uniform. The direction of the change is always the same (so the relation is linear) but the rate of change increases or decreases (hence a nonmonotonic relation)." In contrast, a monotonic relation is said to characterize two variables "when an increase in one always ('monotonously') produces an increase (or decrease) in another. This relation is often, but not necessarily, linear; increases interrupted by periods of no change are still monotonic as long as there is no reversal of direction."

$$lnfditms = \ln (nufditms + 1)$$

where *lnfditms* is the transformed dependent variable

nufditms is the actual number of food items per household

ln represents natural logarithm

Calorie intake per adult equivalent. Calculation of household caloric intake was based on the reported quantities bought/eaten in the previous week, monthly purchases having been converted into weekly basis by dividing the monthly quantities by 4.3. A food conversion table developed by SALDRU and integrated into the food data files was used for transforming the amounts eaten into the same units (i.e., kilograms) and for computing the energy or calorie components of the different food types. The resultant weekly total calories for all food types per household were then converted into daily intakes, and subsequently expressed on a per adult equivalent basis. Adult equivalent units within a household were calculated based on the information on Table 4. A further examination of the distribution of this variable through stem-leaf plots revealed that approximately 145 households had 5000 or more calories per adult equivalent per day. These outlying cases, also observed as influential data points, were excluded from bivariate analyses and model estimation.

Anthropometric analysis

Anthropometric analysis is at individual and household levels. All 6015 South African children with height, weight, age, and gender data were imported into Epi Info Version 6 and analyzed in EPINUT. The indices calculated from this program were then imported back to SPSS for Windows to permit comparisons of these z-score indices with those derived by SALDRU, and to evaluate whether or not African children in urban, metropolitan, and rural South Africa differed in terms of their anthropometric status. From the processed South African file, data on 2-6 year-old rural African children were selected and re-imported back to EPINUT for further analysis. The outputs from this second processing included a summary of the flagged indices excluded in the analysis, malnutrition indicators by gender, descriptives of the distribution (i.e., mean, median, standard deviation) including the standardized prevalence of malnutrition levels by gender, and individual graphs on each index. Flagged indices reflect problems of data accuracy stemming either from

Table 4. Adult equivalent consumption units by age and sex.[1]

	Adult Equivalent Consumption Units	
Age (Years)	Male	Female
< 1 year old	0.27	0.27
1	0.39	0.39
2	0.45	0.45
3	0.52	0.51
4	0.57	0.56
5	0.62	0.60
6	0.67	0.63
7	0.71	0.67
8	0.75	0.70
9	0.79	0.74
10-12	0.87	0.78
13-15	0.97	0.83
16-19	1.02	0.77
Adult	1.00	0.73

[1] Taken from Trairatvorakul, P. 1984. *The Effects on Income Distribution and Nutrition of Alternative Rice Price Policies in Thailand.* IFPRI Research Report No.46. Washington, DC: International Food Policy Research Institute.

incorrect data entry, incorrect ages/dates of birth, weight or height measurements entered incorrectly or in the wrong units, and missing data (Sullivan et al, 1994:8). Of the 2209 rural African children cases examined, 17.4 percent of the weight-for-height anthropometric data had been flagged. The corresponding figures on the height-for-age and weight-for-age parameters were 17.2 and 14.2 percent, respectively. Inasmuch as these flagged indices were excluded in the analysis in EPINUT, these were likewise declared as missing in the SPSS individual-level anthropometric data file.

Undertaking the household level analysis of children's anthropometric status involved taking a sample child from the processed file, particularly from households having two or more 2-6 year-old children. Systematic random sampling was the selection procedure

followed. The subset obtained, totaling 1623 cases, were then re-analyzed in EPINUT and SPSS for Windows to determine whether these reflected the patterns exhibited by the larger group from which they have been derived. The final measures of child anthropometric status used as endogenous variables in model estimation were the household-level weight-for-height (W/H) and height-for-age (H/A) indices. The exclusion of the weight-for-age index is based on an argument that this parameter is "primarily a composite of W/H and H/A, and fails to distinguish tall, thin children from short, well-proportioned ones (Sullivan et al., 1994:3)."

Individual- and household-level analyses

In addition to anthropometric status of rural African children, employment status of adults is the only other variable examined at the individual level. The preliminary procedures taken in this regard involved evaluating whether or not one or more of the individual members of a household were (a) engaged in agricultural work when the household had access to land and farm animal holdings, and (b) participating in household self-employment activities when the unit had access to home-based self-employment enterprises. The task was undertaken to assess consistency of individual- and household-level reports regarding their employment status especially in light of the seeming high levels of unemployment among the household adult members. While the data did not reveal significant discrepancies, there were a number of instances when adjustments had to be made. That is, a reportedly unemployed adult member was attributed with an agricultural employment when none of the household members were said to be engaged in agriculture yet the household had access to land and/or farm animal holdings, and showed activities (e.g., sale of agricultural produce) along subsistence agriculture. The same procedure was followed in imputing a self-employment activity to a household member who was said to be unemployed. Thus, a reportedly unemployed adult was considered to be engaged in other self-employment when the household of which (s)he is a member did not have any of its members participating in a home-based enterprise to which the unit had access. There were no specific criteria for selecting the unemployed member upon whom an agricultural employment or other self-employment activity was ascribed. The step taken simply involved assigning either of these

two forms of employment to the first adult member said to be unemployed, regardless of gender, age, and education, if there were more than one unemployed adults in the household and when the unit had access to the corresponding resources. To reiterate, the objective was to look into how much of the unemployment levels was arising from inconsistent reports at the individual- and household-levels and, subsequently, to arrive at a congruency in said reports. It is based on this adjusted file that individual-level examination of employment status has been made in relation to household adult members' gender, age, and education.

All other analyses done on the data, including model estimations, were at the household level, the household being the principal unit of analysis of this study.

CHAPTER 4 – RESULTS AND DISCUSSION

The presentation of the study findings is in two parts. The first focuses on a description of households' characteristics, survival strategies, income and expenditures, food consumption patterns, and their children's anthropometric status. The second part delves into the multivariate relationships between and among the related elements that have been argued to causally contribute to rural African households' nutritional well-being.

Rural African Households and their Attributes

Geographical location

Rural African households examined in the study are located in nine provinces of South Africa (Table 5). Units in "predominantly rural areas with poor economic prospects" (von Bach, 1994:6) – particularly the Eastern Cape, Natal, and Northern Transvaal – are proportionately represented, with each accounting for about a fourth of the households surveyed. The few households obtained in Gauteng and the Northern and Western Cape may be due to the high levels of urbanization in these regions and to the fact that, in the two Cape provinces, a majority of the population is made up of those in the Colored, rather than African, racial grouping (von Bach, 1994:6).

Household structure and characteristics

African households in rural South Africa reflect a headship pattern that has come to be increasingly recognized in most developing countries. This pattern is that of a household having either a *de jure* female head, a *de facto* female head, or more conventionally, a male head. In the rural South African setting, the distribution of these types of heads is 28, 16, and 56 percent, respectively (Table 6). *De facto* female heads are younger, with a mean age of 46 years and are more likely to have higher levels of education at 3.61 years. The oldest and least educated heads are the *de jure* heads who also appear to be predominantly without spouses.

Table 5. Distribution of rural African households by geographical location.

Geographical Locale	n	Percent
Western Cape	13	0.3
Northern Cape	2	0.1
Eastern Cape	799	20.8
Natal	787	20.5
Free State	251	6.5
Mpumalanga[1]	517	13.5
Northern Province [2]	780	20.3
N.W.	681	17.8
Gauteng[2]	4	0.1
TOTAL (weighted)	3834	100.0

[1] Formerly Eastern Transvaal
[2] Formerly Northern Transvaal
[3] Formerly Pretoria, Witwatersrand, and Vereeneging (P.W.V.)

Analyses of the differences among the units that these heads represent have been made in terms of the head's gender and in terms of whether or not the households have up to 72-month-old children. For ease of comparisons based on the head's gender, *de jure* and *de facto* female heads are combined as female-headed households. Together, these units make up 44 percent of the households, are likely to be older, and to have lower educational levels than male-headed units (Table 7). Albeit small, the differences in means between these household types are significant.

The composition of households differs according to whether the head is female or male. Female-headed units have adult members who are younger (mean age of 28 years) and who have had about a year more of formal schooling than the adults in the male-headed households. The households headed by females also tend to be larger, with a mean size of 6.35 members, and to have more labor power (4.39 units). A majority of their households are structured on an extended basis, a finding that may account for their larger number of dependents. At a seemingly equal number of 0 -72 month old children in households headed

Table 6. Characteristics of household heads by gender.

	Female Heads					
	De jure		*De facto*		Male Heads	
Characteristics	%	n	%	n	%	n
Age (mean years)***	56.19	1029	46.03	571	47.11	2076
15-29	5.6%	58	4.0%	23	14.0%	291
30-39	10.7%	110	23.3%	133	23.6%	489
40-49	16.2%	167	37.0%	211	20.5%	426
50-59	18.2%	187	24.2%	138	17.5%	364
60 and over	49.3%	507	11.4%	65	24.4%	506
Education (mean years)***	2.35	1049	3.61	611	3.26	2103
0-3 years	69.7%	731	50.7%	310	56.9%	1197
4-9 years	25.6%	269	44.4%	272	37.5%	788
10 years with specialized training or university	4.7%	49	4.9%	30	5.6%	118
Percent of heads with no reported spouse	97.9%	1036	–	–	28.1%	600

***Households significantly different at p = .000.

by females and males, the dependents in the former's households appear to be fairly older children with ages ranging from 7-14 years.

Significant differences also characterize female- and male-headed households when their access to resources is examined. That is, while more than two-thirds of the male-headed units do not have access to land, the mean size of those that have access is twice that of their female-headed counterparts (3.04 hectares). Moreover, households headed by males appear to grow a few more crops, to own more livestock, and to have greater access to a farm vehicle, mechanical farm equipment, or a non-mechanical farm implement. Thus, while female-headed households may have an overall edge compared to their male-headed counterparts in terms of having younger and more educated adult members, of having more labor power, as well as of being characterized with a relatively higher overall index of access

Table 7. Household characteristics by gender of household head.

Characteristics	Female Heads		Male Heads		All	
	Mean	n	Mean	n	Mean	n
Age (years)						
Household heads**	52.56	1599	47.11	2076	49.48	3676
Non-head adults**	27.69	1511	31.52	1680	29.71	3192
Education (mean years)						
Household heads**	2.81	1661	3.26	2103	3.06	3763
Non-head adults**	5.30	1511	4.49	1679	4.87	3191
Household Size (mean size)**	6.35	1691	5.41	2136	5.83	3826
Single-person households	4.9%	83	20.5%	438	13.6%	521
2-4 members	26.5%	448	24.5%	522	25.4%	970
5-7 members	36.9%	623	28.7%	612	32.3%	236
8 or more members	31.7%	536	26.3%	563	28.7%	1099
Percent with Extended Structure	63.5%	1074	40.3%	860	50.5%	3826
Labor Power**	4.39	1651	3.82	2092	4.07	3742
Dependency Ratio**	1.12	1411	1.10	1426	1.11	2837
Number of children per household (≤72 months)	1.76	926	1.76	990	1.76	1916
Percent of Female Adults	0.49	1661	.49	1683	0.49	3344
Access-to-Resources Attributes						
Type of access to land						
None	65.9%	1110	75.6%	1608	71.3%	2718
Communal/other access types	11.2%	188	6.8%	145	8.7%	333
Communal-rented/communal-owned combinations	21.7%	365	16.0%	340	18.6%	705
Owned/rented/owned-rented combinations	1.2%	21	1.6%	33	1.4%	54
Size of land (hectares)*	1.51	502	3.04	458	2.24	960
Number of crops grown*	1.80	306	1.99	309	1.90	615
Livestock holdings (cattle equivalent)**	4.47	419	6.07	491	5.33	910
Vehicles, equipment, tools owned**	1.05	390	1.21	359	1.13	749
Index of access-to-resources attributes**	2.55	1653	2.13	2098	2.27	3751

*Households significantly different at p≤.10.
**Households significantly different at p≤.01.

to resources, the latter seem to be in a better position in harnessing their assets as income and/or food sources. It should be emphasized, however, that these differences apply to only approximately a third of all the households. The general picture that surfaces is that, regardless of headship, lack of access to resources prevails among the majority of the rural African households.

Comparisons of the households in terms of presence or absence of up to 72-month old children reveal equally interesting patterns (Table 8). Female headship, for instance, seems to be more prevalent in households with children. In more than half of these units, females stand as heads. The reverse is true of households without children. Here, about 53 percent are headed by males. Household heads in units with 0-72-month-olds are older at 51 years and have relatively lower educational levels of 2.88 years than the heads of households without young dependents. As in female-headed households discussed above, units with children are more likely to have a large number of household members (mean size of 7.86), to have more labor power (5.01 units) and, expectedly, to have a higher dependency ratio. In addition, they appear to have better access to production resources, as more than a third of them have varying levels of access to land. There are no statistically significant differences in these two household types in regard to the size of their land-holdings. Households with children, however, reflect a pattern of having twice the number or unit of assets than those owned by households without children. This seems to suggest that the presence of children in a household creates an imperative to maximize its less than adequate resources. Worth noting again, however, is the finding that, with or without children and whether the household is headed by a female or a male, lack of access to resources occurs among a significantly large proportion of the households.

Survival strategies

The mechanisms that rural African households have employed to meet their livelihood, income, and food needs include those that are based on non-asset and non-employment receipts (e.g., pensions and similar income transfers), those that draw upon their sparse resources, those that involve engaging in various forms of employment, or those that

Table 8. Characteristics of households with and without children (up to 72 months of age).

Characteristics	Households			
	With children		Without children	
	Mean	n	Mean	n
Gender of Head				
Female	56.7%	926	43.3%	708
Male	47.3%	990	52.7%	1103
Age (years)				
Household head**	50.64	1828	48.08	1844
Non-head adult members**	28.94	1874	30.79	1240
Mean Education (years)				
Household heads**	2.88	1883	3.32	1791
Non-head adult members	4.92	1874	4.83	1239
Household Size**	7.86	1924	3.69	1812
Single-person households	–	–	28.8%	522
Small	13.7%	263	36.9%	669
Medium-sized	38.8%	747	25.1%	455
Large	47.5%	914	9.1%	165
Labor Power**	5.01	1874	3.11	1812
Dependency Ratio**	1.25	1862	0.84	935
Access to Resources Attributes				
Types of access to land (%)**				
None	63.6%	1217	79.8%	1440
Communal/other access types	11.0%	210	6.0%	109
Communal-rented/ communal-owned combinations	23.9%	458	12.8%	231
Owned/rented/ owned-rented combinations	1.5%	28	1.4%	25
Size of land (hectares)	1.71	624	3.30	314
Number of crops grown	1.87	385	1.91	215
Livestock holdings (cattle equivalent)	5.42	590	5.33	288
Vehicles, equipment, tools owned (mean)	1.14	492	1.10	243
Index of access-to-resources**	2.92	1883	1.57	1783

**Significant at $p \leq .01$.

entail undertaking both asset and employment strategies (Table 9). Given the low proportion of households that have access to resources, only 0.4 percent use asset-oriented activities, a majority of which are female-headed units. Approximately 49.1 percent of all the households rely on employment activities. Due perhaps to the lack of production assets in their households or to the low incomes to be earned from agricultural production in comparison to gainful employment, more than half of these households are male-headed. Efforts to combine asset and employment strategies are more common among female-headed households (49 percent), although more than a third of the male-headed ones also utilize both strategy types.

Table 9. Survival strategies by gender of household head.

	Household Head					
	Female		Male		All Households	
Survival Strategies	%	n	%	n	%	n
Non-asset and Non- employment Strategies***	15.4	167	7.2	137	10.2	304
Asset Strategy Only***	0.6	7	0.2	4	0.4	11
Employment Strategy Only***	34.9	378	57.2	1085	49.1	1463
Asset and Employment Strategies***	49.0	531	35.4	671	40.3	1202
TOTAL	100.0	1083	100.0	1897	100.0	2980

***Significant at p = .000.

A closer look at the characteristics of the households and the range of strategies that they have offers insights into why and how rural African units cope with their marginal conditions (Table 10). From among the four types of households examined in relation to their livelihood mechanisms, units with non-asset and non-employment strategies have household heads and other adult members with the lowest levels of educational attainment at 2.4 and 4.21 years, respectively. Household heads and non-head adults in these households

Table 10. Household characteristics and survival strategies.

Characteristics	With Non-asset and Non-employment Strategies		With Asset Strategy Only		With Employment Strategy Only		With Asset and Employment Strategies	
	Mean	n	Mean	n	Mean	n	Mean	n
Age (years)								
Household heads**	54.84	282	59.98	10	42.44	1437	55.76	1144
Non-head adults**	30.79	218	28.79	8	28.92	1002	30.39	1143
Education (years)								
Household heads**	2.40	299	3.25	12	3.70	1441	2.59	1185
Non-head adults**	4.21	218	6.44	8	4.86	1002	4.98	1142
Households Size (mean size)	4.19	305	3.68	12	4.34	1465	7.36	1203
Single-person households (%)	15.7	48	16.7	2	29.3	430	3.0	36
2-4 members (%)	43.6	133	50.0	6	27.6	405	19.8	238
5-7 members (%)	29.5	90	25.0	3	26.8	393	33.8	407
8-22 members (%)	11.1	34	8.3	1	16.2	238	43.4	795
Percent with an Extended Structure	50.2	153	63.6	7	33.2	486	66.3	798
Labor Power**	2.70	296	2.43	12	3.17	1454	5.10	1162
Dependency Ratio**	1.63	194	1.36	7	0.97	859	1.15	1026
No. of Children/Household (< = 72 months)	1.71	122	1.25	4	1.64	564	1.83	729
Percent of Adults that are Female	0.56	269	0.52	11	0.50	1076	0.48	1161

* Households significantly different at $p \leq .10$.
** Households significantly different at $p \leq .01$.

Table 10. (continued)

Characteristics	With Non-asset and Non-employment Strategies		With Asset Strategy Only		With Employment Strategy Only		With Asset and Employment Strategies	
	Mean	n	Mean	n	Mean	n	Mean	n
Access-to-Resources Attributes								
Types of access to land (%)								
None	100.0	305	–	–	100.0	1465	34.5	412
Communal/other	–	–	100.0	12	–	–	18.7	224
Communal-rented/communal-owned								
Combinations	–	–	–	–	–	–	43.3	518
Owned/rented/owned-rented combination	–	–	–	–	–	–	3.4	41
Size of land (hectares)	–	–	0.62	2	–	–	2.48	706
Number of crops grown *	–	–	2.54	2	–	–	1.92	442
Livestock holdings (cattle equivalent)	–	–	3.30	2	–	–	5.45	629
Vehicles, equipment, tools owned	0.88	1	1.00	8	1.00	2	1.16	524
Index of access-to-resources attributes*	0.00	305	2.55	10	0.00	1465	5.25	1167

also seem to be older compared to those units that have one or more survival strategies. It is also these households that have the highest dependency ratio and, like the households with employment activities and those with both asset and employment strategies, an average of two children appears to be in their care. All of the households in this category do not have access to agricultural resources.

Moving to the other end of the continuum, households with both asset and employment livelihood mechanisms or with multiple strategies seem to be those that are able to harness two strategy types due to the seeming advantages that these units have. That is, while the heads of these households have fairly low educational levels at 2.59 years, labor power index is high at 5.10 and two thirds (65.5 percent) have varying levels of access to land. Livestock raising appears to be an important component of their asset strategies since a high average of 5.45 cattle equivalent units also make up the resources over which they have access. A majority of these households (66.3 percent) are organized on an extended basis. This may partly account for the high labor power index and, thus, the ability to engage in asset and employment strategies at the same time.

Only a handful of households use the single strategy of drawing upon assets for livelihood. Recalling that the predominant units undertaking this strategy are headed by women, these households are more likely to have the oldest household heads (59.98 years) and to have adults (i.e., heads and non-heads) with relatively higher educational levels. Many of these households (63.6 percent) are based on an extended family system but this does not appear to translate into high labor power units given a fairly low index of 2.43. Access to land for these households is mostly on a communal basis at a meager average size of 0.62 hectares. This lack of land seems to be compensated for by partly engaging in livestock raising at an average of 3.30 cattle equivalent units. Examining the more specific asset-related activities of these households in Table 11, the small land-holdings over which they have access seems to be used by the majority (91.7 percent) for growing crops. In 1993, these households used at most half of their land for crop production. The produce from their agricultural activities were used by almost all of them for home consumption. However, some of them (16.7 percent) sold 1-3 products (e.g., fruits, vegetables, milk, eggs, wool, and

Table 11. Household asset-oriented strategies (%).

Strategies	With Non-asset and Non-employment Strategies	With Asset Strategy Only	With Employment Strategy Only	With Asset and Employment Strategies
Type of Land Use***				
No access to land	100.0	–	100.0	34.1
Does not use	–	–	–	1.1
Grazing and partly for crop use	–	8.3	–	23.5
All/most for crops	–	91.7	–	41.3
Total	100.0	100.0	100.0	100.0
(n)	(305)	(12)	(1465)	(1204)
Extent of Crop Land Used (1993)***				
No access to land	100.0		100.0	34.1
None used	–		–	1.1
Less than to about half used	–	83.3	–	23.5
More than half or all used	–	16.7	–	41.3
Total	100.0	100.0	100.0	100.0
(n)	(305)	(12)	(1465)	(1204)

*** Significant at p = .000.

Table 11. (continued)

Strategies	With Non-asset and Non-employment Strategies	With Asset Strategy Only	With Employment Strategy Only	With Asset and Employment Strategies
Diversity of Farm Enterprises***				
No access to crop/animal production	100.0	–	100.0	18.0
Engaged in crop production only	–	83.3	–	10.0
Engaged in animal production only	–	–	–	45.3
Engaged in both crop and animal production	–	16.7	–	26.8
Total	100.0	100.0	100.0	100.0
(n)	(305)	(12)	(1465)	(1203)
Sale of Agricultural Products***				
No access to crop/animal production	100.0	–	100.0	18.0
None sold	–	91.7	–	10.0
1-3 plant/animal products sold	–	8.3	–	45.3
4-8 plant/animal products sold	–	–	–	26.8
Total	100.0	100.0	100.0	100.0
(n)	(305)	(12)	(1465)	(1203)

mohair). Households with both asset and employment strategies demonstrate a similar pattern. As was inferred earlier, however, livestock production is an important part of their asset-oriented strategies, as more than half of them engage in this activity as well. These households, like those who depend solely on asset strategies, apparently look to their agricultural produce for food, since some 63 percent did not sell said products.

As noted in Table 9, households that are engaged solely in employment strategies make up about half of all the rural African units analyzed. These households, in general, are more likely to have heads who are younger (mean age of 42.4 years) and who have attained an average of 4 years of formal education (see Table 10). Only a third of these households have an extended structure and, while there is an average of two children within these units, there appears to be a correspondence in the number of dependents and non-dependents at a low dependency ratio of 0.97. Not surprisingly, it is these households that do not have access at all to production resources such as land and farm animals. Consequently, these households appear to have at least one adult member participating in the labor market (Table 12). Consistent with the emerging pattern, more of the female-headed units have members who are unemployed (1.1 percent) than the male-headed ones (0.3 percent).

A better understanding of the employment status of rural African households can be reached by examining the individual level labor allocation patterns in these units. In general, a majority of the households' adult members (84 percent) are residents of their respective units while only about 13 percent are non-residents (Table 13). Among resident members, more than half (60.6 percent) have been reported as unemployed, a large proportion of which are the female members. The few who were able to gain entry into regular wage employment are mostly males (29.9 percent), although a small proportion of the females (12.5 percent) also participated in this type of employment. Non-resident members' occupational involvement (or lack of it) appears to be not known by most households, given that about 99 percent were unable to tell what these members do for their livelihood.

Analyzing the female and male members' employment status against their households' access to agricultural production resources reveals a consistent pattern of high

Table 12. Household-level employment patterns (%).

Variable	Survival Strategies				All Households
	With Non-asset and Non-employment Strategies	With Asset Strategy Only	With Employment Strategy Only	With Asset and Employ-ment Strategies	
Female-Headed Units***					
None of the adults employed	100.0	100.0	1.1	–	16.4
One adult member employed	–	–	74.7	74.0	62.4
Two adult members employed	–	–	18.2	19.0	15.7
Three adult members employed	–	–	6.1	7.0	5.5
Mean	–	–	1.31	1.36	1.13
TOTAL	100.0	100.0	100.0	100.0	100.0
(n)	(167)	(7)	(379)	(531)	(1084)
Male-Headed Units***					
None of the adults employed	100.0	100.0	0.3	–	7.6
One adult member employed	–	–	71.6	65.9	64.3
Two adult members employed	–	–	22.7	22.7	21.0
Three adult members employed	–	–	5.4	11.5	7.2
Mean	–	–	1.35	1.52	1.31
TOTAL	100.0	100.0	100.0	100.0	100.0
(n)	(137)	(4)	(1085)	(671)	(1897)

*** χ^2 tests significant at p = .000.

Table 13. Resident/non-resident household members' labor allocation patterns by gender (%).

Form of Labor Allocation	Gender		All
	Female	Male	
Resident Members**			
No activity recorded	5.1	6.5	5.7
Unemployed/no formal employment	69.3	49.1	60.6
Regular wage employment	12.5	29.9	20.0
Casual wage employment	2.3	3.1	2.6
Agricultural self-employment	7.1	8.4	7.7
Other self-employment	3.6	3.1	3.4
TOTAL	100.0	100.0	100.0
(n)	(6468)	(4943)	(11411)
Non-resident Members**			
No activity recorded	98.7	98.8	98.8
Unemployed/no formal employment	1.2	0.7	0.8
Regular wage employment	0.1	0.3	0.3
Casual wage employment	–	0.1	0.0
Agricultural self-employment	–	0.1	0.1
Other self-employment	–	–	–
TOTAL	100.0	100.0	100.0
(n)	(782)	(1462)	(2244)

** χ^2 tests significant at $p \leq .01$.

unemployment levels, particularly among females (Table 14). Unemployment rates appear to be most prevalent among households that have neither land nor farm animals with females (64.2 percent) being disproportionately unemployed compared to males (38.9 percent). Interestingly, it is also these without-resources-households that are more likely to have high regular wage employment rates, in that 34.9 percent of the males and 16.6 percent of the females have been reported to be engaged in this type of work. On the other hand, those with one or more production assets appear to have members either in casual wage employment, in agriculture-based self-employment, or in home-based self-employment enterprises. It would seem, then, that access to some asset enables household members to branch out their livelihood activities and to not limit themselves to a single strategy. However, it may also be that these household members engage in these forms of employment because of the inadequate and unstable incomes obtained from the assets that they own or to which they have access.

An examination of the (un)employment status of individual household members in terms of their age groups likewise shows distinct trends (Table 15). Unemployment rates appear to be highest among those who are under 29 years old, and higher among females (69.8 percent) than among males (55.7 percent). Regular wage employment is more commonly observed among females who were 30-39 (20.2 percent) and those who were 40-49 (20.8 percent). The same pattern is depicted among the males. For these individuals, however, regular wage employment for those in the 50-59 age group does not seem to be uncommon, since about 35.4 percent of them were noted to also be regularly employed. Agricultural self-employment rates are highest among females' and males' older age groups (i.e., 60 years of age and over) while engagement in other self-employment enterprises occurs frequently among the 40-49 and 50-59 year old cohorts of females and males.

The picture on household members' employment status when their educational levels are considered holds few surprises (Table 16). Regardless of educational levels, unemployment rates are high among females and males. Unemployment is particularly high among those who have had 4-9 years of formal education (at 65.7 percent of females and 44.7 percent of the males). Interestingly, males appear to gain access to regular wage employment

Table 14. Employment status and access to land and farm animal assets by gender (%)[a]

Employment Status	With No Land, No Farm Animal Holdings	With Farm Animals, but No Land Holdings	With Land but No Animal Holdings	With Land and Animal Holdings	Total
Females*					
No activity reported	14.0	13.1	17.6	18.1	15.3
Unemployed	64.2	58.4	54.7	62.6	61.8
Regular wage employment	16.6	9.1	7.6	4.4	11.2
Casual wage employment	2.1	2.2	2.4	1.6	2.0
Agricultural self-employment	0.1	13.0	13.8	10.6	6.4
Other self-employment	3.1	4.1	4.0	2.7	3.3
TOTAL	100.0	100.0	100.0	100.0	100.0
(n)	(3362)	(1118)	(805)	(1922)	(7207)
Males					
No activity reported	21.4	27.7	31.4	37.5	27.5
Unemployment	38.9	38.1	37.4	36.6	38.0
Regular wage employment	34.9	17.7	14.2	7.7	23.1
Casual w/ employment	2.4	1.7	3.3	2.2	2.3
Agricultural self-employment	0.1	12.8	10.9	13.6	6.6
Other self-employment	2.4	1.9	2.8	2.5	2.4
TOTAL	100.0	100.0	100.0	100.0	100.0
(n)	(3105)	(975)	(634)	(1655)	(6369)

*χ^2 tests significant at $p < .10$.

[a] Farm animal resources include all cattle, goats, sheep, pigs, and poultry. Imputing a household member into agricultural self-employment was based on ownership of all these farm animals after comparing distribution with ownership of livestock only (i.e., excluding poultry).

Table 15. Individual labor allocation patterns by age and gender (%).

Form of Labor Allocation	Age in Years				
	15 – 29	30 – 39	40 – 49	50 – 59	60 and over
Females**					
No activity reported	19.4	17.6	13.0	8.7	3.1
Unemployed	69.8	51.8	52.1	54.1	61.8
Regular wage employment	6.9	20.2	20.6	15.9	2.5
Casual wage employment	1.3	2.8	3.7	3.4	1.1
Agricultural self-employment	1.0	3.0	4.3	11.9	28.6
Other self-employment	1.6	4.6	6.3	6.0	2.9
TOTAL	100.0	100.0	100.0	100.0	100.0
(n)	(3469)	(1339)	(887)	(586)	(971)
Males**					
No activity reported	25.6	33.4	36.0	29.1	14.0
Unemployed	55.7	20.9	15.0	13.2	31.3
Regular wage employment	14.6	36.3	37.8	35.4	11.3
Casual wage employment	2.0	3.2	2.8	3.5	1.3
Agricultural self-employment	0.9	3.3	5.0	13.4	39.2
Other self-employment	1.3	3.0	3.4	5.4	2.9
TOTAL	100.0	100.0	100.0	100.0	100.0
(n)	(3221)	(1244)	(794)	(537)	(613)

**χ^2 tests significant at $p < .01$.

Table 16. Individual labor allocation patterns by educational levels and gender (%).

Form of Labor Allocation	Level of Education (Years)		
	0 – 3	4 – 9	10+[a]
Females**			
No activity reported	10.7	17.6	21.8
Unemployed	60.5	65.7	48.8
Regular wage employment	10.2	9.4	25.8
Casual wage employment	2.7	1.7	0.8
Agricultural self-employment	11.8	2.9	0.9
Other self-employment	4.1	2.7	1.9
TOTAL	100.0	100.0	100.0
(n)	(2930)	(3664)	(633)
Males**			
No activity reported	26.9	27.2	32.1
Unemployed	30.0	44.7	34.9
Regular wage employment	25.7	20.2	27.7
Casual wage employment	3.2	1.9	1.6
Agricultural self-employment	12.0	3.2	2.6
Other self-employment	2.2	2.7	1.1
TOTAL	100.0	100.0	100.0
(n)	(2447)	(3303)	(614)

** χ^2 tests significant at $p < .01$.

[a] With specialized training or some university education.

whether or not they completed a year or more of formal schooling. For females, however, regular wage employment seems to go with higher educational levels. This finds support in the fact that 25.8 percent of those in this type of employment have had 10 years or more of education. As was gleaned from earlier household-level findings, individuals who have self-employment activities in agriculture are more likely to have lower levels of education (i.e., 0-3 years), being 11.8 percent among females and 12.0 percent among males.

The foregoing individual level analysis essentially affirms the employment conditions at the household level. More specifically, the seemingly gender-biased opportunities for employment inhibit individual females' participation in the labor market such that, at the household level, female-headed units tend to be confined to asset- or agriculture-based strategies while male-headed units are predominantly able to engage in various forms of employment for livelihood. An added perspective that has been obtained in examining individual-level employment status relates to why, in Table 12, approximately 16.4 percent of the adults in female-headed units and 7.6 percent in male-headed ones have been said to be unemployed. Clearly, the high rates of unemployment at the individual level bear as well on the household in that despite seemingly adequate labor power units, the average number of those employed per household hovers around the average of 1.

To better understand the dynamics that underlie the 'adoption' of a particular survival strategy by a household, case studies on four households utilizing each of these four mechanisms are presented in Appendix C. The next section attempts to shed light on how these survival strategies translate into total monthly income and food expenditure patterns at the household level.

Household income and food expenditure patterns

The total monthly income of rural African households is obtained, in general, from one or more of eight possible sources, most of which can be said to have been earned from non-asset and non-employment mechanisms, asset-oriented strategies, employment activities, or from both asset and employment mechanisms (Table 17). In 1993, the households' overall monthly median income was R575 (U.S.$1=R3.50 during the period) with male-headed units

Table 17. Income sources and income by gender of household head.

Income Sources	Female-headed			Male-headed			All Households		
	Median (Rand)[a]	% with income source	n	Median (Rand)[a]	% with income source	n	Median (Rand)[a]	% with income source	n
Monthly Receipts/remittances***	200.00	61	1691	144.49	21	2136	191.67	39	3827
Net Wage Income*	457.56	32	1682	645.00	67	2122	600.00	52	3804
Food Subsidy***	50.00	8	1687	153.60	32	2125	150.00	21	3812
Income from Subsistence Agriculture***[b]	26.78	42	1677	36.35	32	2121	30.82	37	3798
Profits from Home-based Self-employment***	100.00	10	1682	300.00	11	2121	200.00	11	3808
In-kind Income	50.00	23	1691	40.92	6	2136	50.00	14	3827
Other Income***	370.00	39	1683	400.00	27	2113	393.97	32	3796
Housing and travel subsidies	43.00	5	1686	70.00	27	2132	69.31	17	3818
ALL SOURCES ***	437.24	98	1663	704.01	98	2082	575.00	98	3745
Median Income per Capita***	80.00	–	1633	164.01	–	2045	117.50	–	3678
Median Income per Adult Equivalent***	105.02	–	1595	207.41	–	2005	147.40	–	3600

* Households significantly different at $p \leq .10$.

*** Households significantly different at $p = .000$.

[a] Median amounts apply only to households reporting income from specified sources.

[b] Excludes eight households with agricultural income of more than R20,000 per year.

earning 38 percent more than their female counterparts at R704 and R437, respectively[16]. Substantial portions of these amounts appear to come from employment incomes (at net wages of R600), non-asset, non-employment-based receipts (R394), and from asset-based earnings (R200). Comparing the households based on gender of head reveal the consistent pattern that male-headed units are more likely to be well-off than female-headed units as the former appear to have earned larger amounts from a majority of their possible sources. The exception to this seeming generality are the greater earnings that female-headed households obtained from their remittances and in-kind receipts. Also worth noting is that more of these units generated amounts from these sources (61 and 23 percent, respectively), compared to households with male heads (at corresponding figures of 21 and 6 percent). Apparently, *de facto* female heads receive part of the wages of their absent spouses while the *de jure* heads have one or two members of their family who are able to give them monetary support. The median amounts earned from agriculture confirm an earlier contention that male-headed units are able to produce more from their agriculture-based resources even as less of them have access to these assets. Overall, female- and male-headed rural African households' monthly median incomes are extremely low, especially when viewed in terms of per capita (at R80 and R164, respectively) or per adult equivalent basis (correspondingly, at R105 and R207). It should also be noted that the mean differences between female- and male-headed units are highly significant for these two summary measures.

Evaluating the income sources and incomes received by households against their range of survival strategies also uncovers interesting themes (Table 18). Households with employment strategy only and those having both asset and employment livelihood mechanisms are more likely to have the largest proportions of their income coming from their regular and casual wage employment activities, their non-asset and non-employment-based sources, from remittances, and from home-based income-generating enterprises. Units with two strategies appear to have earned more from three of these sources, however, than those who have employment only as a single strategy. This does not necessarily reflect on their

[16] Median values have been used as a summary measure of actual amounts earned due to the skewness of the distribution. Needless to say, testing for the differences in the incomes earned have employed the mean values. The discussion on household expenditure also uses median amounts for the same stated reason.

Table 18. Income sources, income and survival strategies.

Income Sources	With Non-asset and Non-employment Strategies			With Asset Strat	
	Median (Rand)	% with income source	n	Median (Rand)	% with income source
Monthly Receipts***	128.55	46	267	215.45	58
Net Wage Income*	–	–	267	–	–
Food Subsidy***	–	–	267	–	–
Income from Subsistence Agriculture**	–	–	266	11.99	100
Profits from Home-based Enterprises***	81.55	5	267	–	–
In-kind Income	36.60	9	267	66.85	17
Other Income***	395.00	67	267	372.80	42
Housing and Travel Subsidies	–	–	267	–	–
ALL SOURCES***	358.81	88	302	377.44	100
Median Income per Capita***	110.90	88	302	122.18	100
Median Income per Adult Equivalent***	144.70	88	293	156.67	100

**Households significantly different at $p \leq .01$.

***Households significantly different at $p = .000$.

Strategy only		With Employment Strategy Only			With Asset and Employment Strategies		
with come ɔurce	n	Median (Rand)	% with income source	n	Median (Rand)	% with Income Source	n
58	12	150.00	15	1441	166.67	41	1150
–	12	576.67	92	1441	652.46	46	1150
–	12	150.00	44	1441	87.76	12	1150
00	12	201.60	<1	1441	32.90	80	1143
–	12	200.00	12	1441	150.00	16	1150
17	12	36.07	5	1441	58.33	15	1150
42	12	348.09	13	1441	395.00	50	1150
–	12	70.00	39	1441	50.00	7	1150
00	12	746.55	100	1442	639.02	99	1160
00	12	220.56	100	1442	100.11	99	1160
00	12	274.96	100	1442	129.26	99	1124

income from all sources as the latter exhibited larger median incomes (at R746) than the former (at R639).

An assessment of the situation among these households' 'poorer' counterparts (i.e., those with non-asset and non-employment strategies, and units with asset strategies only) reveals a different picture. For these two types of households that depend on non-employment income sources, receipts of pensions and similar income transfers, as well as of remittances, form the critical bases of their maintenance. Those with asset strategies receive larger remittances than households who depend on non-asset and non-employment monetary inflows (R215 and R128, respectively). On the other hand, the latter are able to have amounts from pensions that are about 6 percent greater than the former. Ranking the four categories of households based on their income from all sources confirms an instinctive supposition that the poorest units are those that have neither asset nor employment strategies (at a total monthly median income of R359). The relatively well-off, on the other hand, are those that depend solely on employment for their livelihood (at the monthly median of R746). This pattern holds as well in terms of monthly median income per capita (R111 and R220, respectively) and of monthly median income per adult equivalent at corresponding averages of R145 and R275. The differences among the households are highly significant, suggesting, to an extent, the validity of these inferences.

The apparent marginal conditions of rural African households may also be analyzed in terms of their units' income levels (Table 19). Comparisons of these units' incomes based on their livelihood mechanisms substantiate the above argument that those with employment strategies are better off than the rest of the households. Only a little more than a third of them (about 37.7 percent) have income less than R155, while almost two thirds of those that have no assets earn only a monthly per capita income up to this amount. Households with both asset and employment strategies form the majority of those falling under the poorest 60 percent (approximately 67.6 percent). It will be recalled that these households have the largest household size, which averages 7.36 members. Female-headed units also appear to be more disadvantaged, in that two thirds of them received amounts of less than R155; this approximation being made up, for the most part, by those with both asset and employment

Table 19. Survival strategies and per capita income quintile (Q) per month by gender of household head (%).

Variable		With Non-asset and Non-employment Strategies	With Asset Strategy Only	With Employ-ment Strategy	With Asset and Employment strategies	All Households
Female-headed Households***						
Less than R49.00	(Q1)	21.6	25.0	14.9	25.6	21.2
R49.00 - R87.99	(Q2)	24.2	12.5	18.4	24.6	22.3
R88.00 - R154.99	(Q3)	22.2	-	18.9	25.2	22.3
R155.00 - R337.99	(Q4)	27.5	37.5	28.1	18.2	23.2
R388.00 and over	(Q5)	4.6	25.0	19.7	6.4	11.0
TOTAL		100.0	100.0	100.0	100.0	100.0
(n)		(153)	(8)	(370)	(516)	(1047)
Male-headed Households***						
Less than R49.00	(Q1)	22.3	20.0	5.0	19.6	11.2
R49.00 - R87.99	(Q2)	18.8	20.0	10.7	21.0	14.8
R88.00 - R154.99	(Q3)	19.6	40.0	17.0	20.6	18.5
R155.00 - R337.99	(Q4)	28.6	20.0	21.9	22.8	22.6
R388.00 and over	(Q5)	10.7	-	45.5	16.0	32.9
TOTAL		100.0	100.0	100.0	100.0	100.0
(n)		(112)	(5)	(1070)	(632)	(1819)
All Households***						
Less than R49.00	(Q1)	22.1	23.1	7.5	22.3	14.9
R49.00 - R87.99	(Q2)	21.7	15.4	12.7	22.7	17.5
R88.00 - R154.99	(Q3)	21.0	15.4	17.5	22.6	19.9
R155.00 - R337.99	(Q4)	28.1	30.8	23.4	20.7	22.8
R388.00 and over	(Q5)	7.1	15.4	38.8	11.7	24.9
TOTAL		100.0	100.0	100.0	100.0	100.0
(n)		(267)	(13)	(1442)	(1150)	(2872)

* Symmetric statistical measures reveal significant association at p = .000.

strategies. Noteworthy also is the pattern that 80 percent of the male-headed, asset-strategy-only households obtained amounts of up to R155, a finding that seems to reinforce a previous observation that access to assets – at least for rural African households – does not necessarily imply relative wealth or edge over other households that do not have these conventional material bases of prosperity. At the same time, it suggests that, apart from the food products for home consumption, there is little else to be derived from these assets by way of income – due perhaps to the poor quality of soils and to lack of infrastructure support for asset-based activities.

A further examination of the resources and employment levels of the households reveals few unexpected dimensions (Table 20). A majority of the highest-earning households (87 percent) do not have access to land compared to about 58.7 percent of the lowest income group (Q_1). Those who have access to land from among these highest earners are more likely to have larger land-holdings, to grow more crops, and to have more livestock holdings than their poorer counterparts. These differences are not statistically significant, however. The critical difference appears to rest on the households' employment levels as those with the lowest income levels (Q_1 . Q_2) tend to have less members employed than those in the higher income levels (Q_3 - Q_4) at averages of 1.21 and 1.33, and 1.43 and 1.55, respectively. Overall, the households do not seem to deviate from an established 'norm' among the developing countries' poor. That is, the disadvantaged units are more likely to be headed by females, are older, have lower educational levels, have large households, and to have a high dependents to non-dependents ratio.

A brief rundown on the households' median expenditure patterns particularly for food, provides additional insights into the socioeconomic conditions of rural African units and, thus, their ability to attain adequate levels of nutritional well-being (Table 21). Examining only the households that reported expenditures on each item, food spending appears to have formed the largest component of household outlays at a mean budget share of 55 percent, with female-headed units having had larger allocations for it than the male-headed ones (58 and 52 percent, respectively). The corresponding median amounts spent were R378 and R361, with the mean difference not reflecting statistical significance. Worth

Table 20. Access to resources, employment status, and household characteristics by per capita income qu

Variable	Q1 Mean	Q1 n	Q2 Mean
Access to Resources			
Type of access to land (%)***			
None	58.7%	430	62.8%
Communal/other	13.1%	96	10.9%
Communal-owned/communal-rented combinations	27.3%	200	24.8%
Owned/rented/owned-rented combinations	1.0%	7	1.5%
Size of land (hectares)	1.66	267	2.90
Number of crops grown	1.76	151	1.82
Livestock holdings (cattle equivalent)	5.10	251	5.21
Vehicles, equipment, and tools	1.10	190	1.10
INDEX OF ACCESS TO RESOURCES	3.15	719	2.93
Employment Status (number employed per household)***	1.21	406	1.33
Household Characteristics			
Gender of head (%)***			
Female	28.9%	472	25.5%
Male	12.9%	264	16.0%
Age of head (years)***	50.22	686	52.09
Education (years)			
Household head***	2.30	722	2.38
Non-head adults***	4.50	714	4.68
Household size***	7.84	740	7.44
Labor power***	5.17	717	5.07
Dependency ratio***	1.18	674	1.14

** Households significantly different at p = .01.

***Households highly significantly different at p = .000.

capita income quintile (Q) per month.

Q2		Q3		Q4		Q5	
Mean	n	Mean	n	Mean	n	Mean	n
62.8%	466	70.3%	510	77.3%	569	87.3%	642
10.9%	81	9.2%	67	6.9%	51	3.4%	25
24.8%	184	18.9%	137	14.8%	109	7.2%	53
1.5%	11	1.5%	11	1.0%	7	2.0%	15
2.90	244	1.46	188	2.34	151	4.01	73
1.82	153	1.89	123	1.99	108	2.17	62
5.21	223	4.83	188	5.98	157	6.31	60
1.10	197	1.09	153	1.09	126	1.37	59
2.93	728	2.41	711	1.93	729	0.94	727
1.33	489	1.43	555	1.55	620	1.32	710
25.5%	417	20.6%	337	17.5%	286	7.4%	121
16.0%	327	18.9%	386	22.2%	454	30.0%	614
52.09	709	53.21	693	51.10	715	41.13	729
2.38	730	2.38	709	3.20	730	4.99	726
4.68	720	4.41	695	5.17	629	6.60	302
7.44	745	6.17	725	5.11	740	2.47	736
5.07	722	4.31	706	3.81	726	2.02	735
1.14	676	1.14	618	1.00	538	0.93	214

Table 21. Median expenditure allocations by type of expenditure and gender of household head.

Expenditure Items	Female-headed				
	Median (Rand)[a]	Average budget share	Percent spending	n	] (
Food	377.88	58	99.9	1691	3
Housing, Utilities, Other Household Expenditures***	111.23	21	99.9	1691	1
Remittances to Non-resident Household Members**	94.21	12	6.7	1689	1
Non-food Spending, including expenses for personal items***	37.74	8	98.2	1691	
Savings and Insurance**	30.00	7	27.5	1691	
Clothing***	33.28	5	76.0	1691	
Educational Expenses***	13.58	3	80.1	1691	
Transportation-related Expenses***	24.00	3	53.1	1691	
Health	5.00	1	57.8	1691	
TOTAL EXPENDITURE PER MONTH***	658.04	–	–	1689	7
Median Expenditure per Capita***	121.50	–	100.0	1689	1
Median Expenditure per Adult Equivalent***	158.16	–	100.0	1649	2

** Households significantly different at p≤ .05.

*** Households significantly different at p≤ .01.

[a] Median amounts apply only to households reporting expenditures on specified items. Comparisons are based only on mea

household head.

ed		Male-headed				All Households			
rcent nding	n	Median (Rand)[a]	Average budget share	Percent spending	n	Median (Rand)[a]	Average budget share	Percent spending	n
9.9	1691	361.13	52	99.8	2127	369.26	55	100.0	3818
9.9	1691	109.74	19	99.3	2136	110.68	20	99.6	3827
6.7	1689	100.0	18	20.6	2132	100.00	17	14.5	3821
8.2	1691	66.00	11	98.5	2136	52.00	10	98.4	3827
7.5	1691	52.00	9	29.4	2136	50.00	8	28.6	3827
6.0	1691	37.01	5	78.1	2136	33.33	5	77.2	3827
0.1	1691	14.58	3	60.4	2136	14.12	3	69.4	3825
3.1	1691	50.00	5	58.9	2136	37.46	7	56.3	3827
7.8	1691	6.67	1	55.1	2136	5.83	1	56.3	3827
–	1689	747.35	–	–	2122	707.50	–	99.6	3827
0.0	1689	166.34	–	100.0	2122	140.64	–	99.8	3820
0.0	1649	206.61	–	98.0	2122	181.03	–	99.8	3735

isons are based only on means of those reporting greater than zero amounts on said items.

noting are the minuscule allocations for health care, at an average budget share of 1 percent for all households, regardless of the head's gender. Such a pattern of spending on health implies several things: one, that households look to indigenous mechanisms to maintain their members' health; two, spending occurs only as needed; and three, health facilities are either subsidized or are not accessible to these units. Allocations for almost all other expenditure items tend to be the same in male-headed and female-headed households. Apart from food expenses, the only other major maintenance costs in which they differ are those that relate to remittances to non-resident members (at 18 and 12 percent budget shares, respectively) and those that bear on regular and occasional non-food spending (at corresponding figures of 11 and 8 percent budget shares). Seemingly, these two expenditure items create a difference in that female-headed units are able to spend more for their food since they incur less amounts on said two items. Conversely, households with male heads spend less on their food because of the larger amounts they put toward remittances and on regular and occasional non-food spending. Overall, median expenditure per capita and per adult equivalent of the households approximate the picture of their monthly income status where female-headed households, at a mean household size of 6.35 and at mean adult equivalent units of 4.90, are more likely to have smaller amounts allocated to its members (R121 and R166, respectively).

A further analysis of food expenditures of the households by the survival strategies they depend on and by monthly expenditure quintiles also yields highly significant variations among the households (Table 22). Viewed against survival strategies, food spending is highest among units with both asset and employment strategies, at a monthly median amount of R441. This seems to be due to their larger household size, such that on a per capita basis they show the smallest allocations for their members. Households with non-asset and non-employment strategies, on the other hand, expended the least monthly amount of R258, an expenditure that formed 60 percent of their total monthly spending. The picture takes on a slightly different slant when allocations for food are considered in terms of per capita expenditure quintiles (Q_x). More specifically, the households that had the highest expenditures (Q_{x5}) spent only 26 percent more than those who had the lowest outlays (Q_{x1}) at R333 and R247, respectively. The contrast in the average budget share of their food

Table 22. Food spending, survival strategies and per capita expenditure quintiles (Q_x) per month.

Variables	Total Food Expenditure			Per Capita Food Expenditure		Per Adult Equivalent Food Expenditure	
	Median (Rand)**	Average budget share (%) ***	n	Median (Rand)**	n	Median (Rand)**	n
Survival Strategies							
With non-asset and non-employment strategies	258.31	60	303	75.41	303	94.69	294
With asset strategy only	326.49	57	12	102.56	12	137.92	12
With employment strategy only	340.85	50	1459	110.64	1459	130.00	1448
With asset and employment strategies	441.15	56	1202	69.11	1202	88.38	1161
Per Capita Expenditure Quintiles (Qx)							
Q_{x1} (below R 74.00)	247.30	60	521	32.43	758	41.97	720
Q_{x2} (R74 - R114.99)	367.49	60	544	56.63	762	71.88	739
Q_{x3} (R115 - R171.99)	444.77	58	577	81.49	767	103.02	757
Q_{x4} (R172 - R293.99)	507.76	54	620	121.01	768	150.99	756
Q_{x5} (R294 and over)	333.30	39	711	200.00	764	230.08	762

***Households are significantly different at p = .000.

spending is particularly striking, as the former allocated only 39 percent of their budget shares on this basic item while the latter had 60 percent of their spending going to food. It should be noted that significant differences obtain among the households, suggesting that a household's survival strategy and income levels do matter in their food spending patterns.

Food consumption patterns

Against the low food spending patterns that the households generally exhibit, the average daily caloric intake per adult equivalent of a unit stands at a similar low of 66 percent of the recommended energy intake (Table 23). This intake is approximately 18 percent below the standard if one recalls that an adequate intake is 80 percent of the recommended levels to be attained by the reference adult (i.e., 2900 kilocalories for a male as the reference adult). Male-headed units, with their previously noted relatively higher incomes and lower rates of food spending, appear to have had lower intakes at about 1856 calories per day per adult equivalent compared to units with female heads who attained daily calories per adult equivalent of 2030. The difference is highly significant, suggesting that the former – despite having an equal proportion of adult females in their households as that in female-headed units (see Table 7) – seem to attach less importance in achieving adequate levels of energy intakes for its members. It may also be that with their higher outlays for non-basic items (e.g., cigarettes/tobacco and alcohol that make up part of the regular non-food spending), less is spent on food and this translates into lower caloric intake per adult equivalent.

The picture on the second measure of households' food consumption patterns – i.e., the number of food items consumed in the past week – is the same. All the households consumed approximately 7 items, 60 percent of which came from plant sources (e.g., maize grain, rice, potatoes, roots and tubers, vegetables, fruits). It will be recalled that the ideal minimum in this instance is a total of 15 items provided that much of the variety comes from plant foods (Hodgson et al., 1994:146). As with the earlier pattern, male-headed units consumed less of the proposed amounts for dietary adequacy (44 percent); their plant food composition of which is also less (57 percent) than their female-headed counterparts (at 47 and 63 percent, respectively). The significant differences between these households, as with the differences characterizing their caloric intake, appear to lend support to a contention in

Table 23. Expenditure, food consumption patterns, and child anthropometric status by gender of household head.

Variable	Female-headed		Male-headed		All Households	
	%	n	%	n	%	n
Expenditure Item (% of monthly total)						
Food***	58	1689	52	2122	55	3811
Health care	1	1691	1	2132	1	3823
Food Consumption						
Daily caloric intake per adult equivalent (% of the recommended 2900 cal)***	70	1426	64	1590	66	3016
Number of food items consumed (% of recommended 15)***	47	1536	44	1682	45	3218
1-4 items (% of recommended)**	18	400	16	588	17	988
5-8 items (% of recommended)	43	627	43	610	43	1237
9-22 items (% of recommended)**	75	510	77	484	76	994
Percent of Food Items from Plant Sources***	63	1542	57	1753	60	3295
Child Anthropometric Status (mean z-scores)						
Weight-for-height	-0.04	597	-0.02	621	-0.03	1218
Height-for-age	-1.48	601	-1.47	627	-1.48	1228
Weight-for-age	-0.91	603	-0.94	626	-0.92	1229

** Households significantly different at p=.05.

*** Households significantly different at $p \leq .01$.

the literature that households with female heads are more likely to have higher levels of energy intake due to their child-, food-, and health-oriented spending patterns (Haddad et al., 1995:18). In addition, the relatively higher income levels obtaining in male-headed households apparently enable them to purchase non-plant-based food items (e.g., meat, tinned fish), such that the overall quality of their food items would seem to contribute less to their dietary adequacy.

Analyzing food consumption patterns against the households' survival strategies validates an earlier finding that units utilizing an asset-oriented strategy consume rather than sell their produce from their agricultural activities (Table 24). These households showed the highest daily caloric intake of 2503, a level that is about 86 percent of the recommended caloric intake. Additionally, they appear to have had an average of 7 food items in the previous week. While low in relation to the recommended 15, these households rank as one of the two that had the most variety in their food items. Worth noting is the composition of the food items they consumed with only 36 percent coming from plant sources. This may be explained by an earlier observation that farm animal production is an important element of their asset-based mechanisms and, as such, enables the households to also derive their needed nutrients from animal sources. The set of households that provides a contrast to these asset-strategy-only units is that which utilizes employment mechanisms only for their livelihood. These units had the lowest energy consumption at 1839 calories per adult equivalent per day, a fairly low proportion of 63 percent of the ideal 2900 kcal. Recalling that more of these households are male-headed and, as such, may depend more on processed foods with their fairly higher income levels, the outcome on energy intake and the low consumption of plant foods is perhaps unsurprising.

Food consumption patterns by monthly per capita expenditure quintiles (Q_{xs}) also show conventional trends (Table 25). Households with the highest expenditure (Q_{x5}) are more likely to attain the recommended threshold of 80 percent for an average individual's minimum requirement while those at the lower extreme (Q_{x1}) are less likely to meet their minimum energy needs (at 78 and 60 percent, respectively). This seems to be true as well of the food variety measure as the latter were able to consume only a third of the recommended

Table 24. Household characteristics and survival strategies.

Characteristics	With Non-asset and Non-employment Strategies		With Asset Strategy Only		With Employment Strategy Only		With Asset and Employment Strategies	
	Mean	n	Mean	n	Mean	n	Mean	n
Total Monthly Expenditure (median Rand)**	258.31	303	326.49	12	340.85	1456	441.15	1202
Percent of Monthly Expenditure on Food (%)**	60	311	57	12	50	1448	56	1202
Daily Caloric Intake per Adult Equivalent**	2194.71	230	2503.35	7	1839.00	1016	1996.47	1018
(% of recommended)	(76%)		(86%)		(63%)		(69%)	
Number of Food Items Consumed**	6.04	263	7.14	12	6.41	1061	7.33	1104
1-4 food items	40.8%	109	25.0%	3	38.5%	407	22.8%	252
5-8 food items	31.8%	85	41.7%	5	32.5%	344	43.1%	476
9-22 food items	27.3%	73	33.3%	4	28.9%	306	34.1%	376
Percent of Food Items from Plant Sources	66.4	265	35.9	12	51.5	1113	63.6	1107
Child Anthropometric Status (mean z - scores)								
Weight-for-height	-0.28	79	0.86	3	-0.07	335	0.08	476
Height-for-age	-1.50	79	-0.40	3	-1.33	337	-1.51	482
Weight-for-age	-1.12	79	0.46	3	-0.89	338	-0.86	482

**Significant at p = .01.

Table 25. Expenditures, food consumption patterns, and child anthropometric status by per capita expenditure quintiles (Q) per month.

	Q_{x1}		Q_{x2}		Q_{x3}		Q_{x4}		Q_{x5}	
Variables	Mean	n	Mean	n	Mean	n	Mean	n	Mean	n
Expenditure Patterns (% of total monthly expenditure)										
Food ***	60.2	758	60.1	762	58.3	767	54.9	768	39.5	764
Health care	1	758	1	762	1	767	1	768	1	764
Food Consumption										
Daily caloric intake per adult equivalent	1265.62	595	1722.56	654	2051.68	661	2300.17	638	2387.13	470
(% of recommended)***	(44%)		(59%)		(71%)		(79%)		(82%)	
Number of food items (mean)***	5.55	625	6.31	679	7.14	692	7.82	696	7.09	530
Percent of food items from plant sources***	68	626	66	679	61	692	59	701	44	592
Child Anthropometric Status (mean z- scores)										
Weight-for-height (W/H)	-0.09	393	-0.06	312	- 0.01	259	0.20	194	0.30	65
Height-for-age (H/A)**	-1.65	396	-1.53	316	-1.48	260	-1.23	194	-0.86	65
Weight-for-age (W/A)**	-1.08	396	-0.97	316	-0.91	261	-0.60	194	-0.79	65

** Significant at $p < .01$.

*** Significant at $p = .000$.

15 items compared to the former who showed a higher dietary diversity of 7.1 items. Interestingly, those in the lower expenditure quintiles are more likely to have most of their food items coming from plant sources while those in the higher end seem to use less of these food items. This finding substantiates the earlier argument that dietary patterns change with higher incomes.

Summing up, food consumption patterns among rural African households leave the impression of an overall low caloric intake per adult equivalent (at 1914 kilocalories or 66 percent of the recommended amounts) as shown in Table 23. Similarly, the number of food items that they consumed falls far below the recommended quantities for dietary adequacy. For this measure, the picture appears to be that even as most of the households derive a fairly substantial part of their food items from plant sources, the actual quantity of 6.8 items is still 55 percent short of the adequate amounts.

Children's anthropometric status

The discussion of the findings on this variable moves from the individual to the household level. The purpose is to first provide an appreciation of levels of nutritional well-being among children in rural South Africa and, subsequently, to depict the picture that obtains at the household level.

One of the first steps taken to examine the anthropometric data on children was to compare the EpiInfo computed indices of weight-for-height (W/H), height-for-age, (H/A), and weight-for-age (W/A) with those generated by the Southern Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town. Paired samples t-tests showed that there were no differences among the indices arrived at through EPINUT in EpiInfo and those calculated by SALDRU (Appendix D). To also see whether 24-72 month-old African children differed on the same indices, independent samples t-tests were administered on the anthropometric data for children in rural and urban areas, those in rural and metropolitan communities, and those in rural and combined urban and metropolitan areas. The results – also shown in Appendix D – showed significant differences between children in rural and urban areas in terms of their W/H and H/A status. African children in rural and metropolitan areas showed significant differences, on the other hand, in their W/A

and H/A anthropometric conditions with rural children showing lower mean z-scores (-.9896 on W/A and -1.500 on H/A) than their metropolitan counterparts (-.7179 on W/A and -.7892 on H/A). Collapsing the children in urban and metropolitan areas into one and comparing this combined group with rural children revealed significant differences on all three indices. That is, while all the children fall within normal nutritional levels, rural children appear to be better off in terms of the weight-for-height parameter at a mean z-score of -.0945 compared to the combined group's mean z-score of -.3020. This minute edge of rural children over the others is not reflected, however, in regard to their height-for-age and weight-for-age status. On these two indices, rural African 24-72 month old children have lower mean z-scores of -1.500 and -.9896, respectively. The corresponding z-scores for the combined group are -.9628 and -.8648.

Focusing only on rural African children's anthropometric status, a total of 1982 24-72 month old children were obtained for further individual-level analysis. Of this total, 48 percent were girls and about equal proportions of the children are distributed over the defined age groups (Table 26). Assessments of this population group's nutritional status – as based on the cut-off of -2 standard deviations (SD) of the median of the NCHS reference population and as applied to all three anthropometric indices – reveal that 10.2 percent of all the children are wasted or thin, over one-fourth (27.4 percent) are stunted, and a little over one-fifth (22.5 percent) are underweight (Table 27). By gender, about the same number of girls and boys have wasting (or thinness) and underweight problems. Retarded linear growth or stunting appears to be more prevalent among the boys than among girls at 29.5 and 25.3 percent, respectively. Mindful of the fact that the height-for-age index (or the basis for identifying stunting conditions) suggests nutritional inadequacy over a period of years, this finding on more of the boys being stunted is of interest since it reflects a seeming reverse bias for girls. It will be recalled that in some cultures, boys are more likely to be favored than girls in terms of food allocations due to the perceived potential economic contributions of a male child to the household.

Examination of malnutrition problems in children by age shows the pattern that a majority of the older children, or at least those in the 48-59 and 60-72 months age group, are

Table 26. Rural African children by age and gender (%).

	Gender		
Age (months)	Girls	Boys	Total
24 – 35	25	27	26
36 – 47	29	29	29
48 – 59	26	25	26
60 – 72	20	19	19
Total	100	100	100
(n)	(959)	(1023)	(1982)

Table 27. Percentage distribution of rural African children below -2SD cut-offs of anthropometric indices by age.

		Age (Months)				
Anthropometric Indices	n	24 – 35	36 – 47	48 – 59	60 – 72	All
Girls						
Weight-for-height (wasted)	81	9.1	9.3	11.5	9.9	10.0%
Height-for-age (stunted)	242	22.4	28.1	24.6	25.5	25.3%
Weight-for-age (underweight)	186	20.6	26.1	23.7	18.3	22.6%
Boys						
Weight-for-height (wasted)	93	11.2	9.6	9.1	12.5	10.6%
Height-for-age (stunted)	302	28.0	27.7	31.2	32.3	29.5%
Weight-for-age (underweight)	198	23.9	17.5	24.7	24.6	22.4%
All						
Weight-for-height (wasted)	173	10.2	9.5	10.4	11.3	10.2%
Height-for-age (stunted)	544	25.3	27.9	28.0	28.9	27.4%
Weight-for-age (underweight)	383	22.3	21.6	24.4	21.4	22.5%

more likely to experience wasting, stunting, and underweight problems. Boys in these age groups conform to this overall norm while most of the girls within the 36-47 month age category are more likely to be of short stature and to be underweight. From this age-based picture, it would seem that younger children are favored in terms of food allocations and quality of food (e.g., breastfeeding). However, these food shares and quality appear to be gradually reduced as the child grows older such that, at 60-72 months, the impact of diminishing food allocations becomes manifest in specific nutritional problems. Beaton et al., (1990:5) support this finding with the following explanation:

> ...At birth, infant weight and length are determined by maternal factors... During the first 4-6 months, infant feeding practices and maternal health (and ability to take care of the baby) are the main influences on growth... From about 4-6 months through two years of age, weaning practices and exposure to infectious diseases have a major effect. *As the age of the child increases, household access to food may have more importance* [italics added].

Recalling that this study analyzed 24-72 month-old children, the above contention that access to food accounts for child nutritional problems seems valid. That is, older children appear to have less access to nutritious food as they are weaned and as they are fed with food items that are of less quality (e.g., diluted milk or porridge) and quantity; such reduced quality and quantity being due to the household's inability to have adequate access to food.

The prevalence of malnutrition among the rural African children may also be determined by examining the number of those whose z-scores fall 2SD and 3SD below the median of the NCHS reference population (Table 28). Among both boys and girls, the standardized prevalence[17] of wasting is 8.55 percent, suggesting that the incidence of the condition is neither low nor high when compared to the reference population's 2.3 percent for all three anthropometric indices (Sullivan et al., 1994:3; WHO, 1983:32). This proportion

[17] Standardized prevalence refers to the proportion of the study population that falls below a defined malnutrition cut-off point, as expressed in a standardized form (Sullivan et al., 1994:3). Numerically, the actual prevalence is the proportion of individuals who really are malnourished (i.e., those below the defined cut-off) divided by the sample population (Gibson, 1990:13). Gibson (1990:13) further notes that prevalence influences the predictive value of a nutritional index more than any other factor.

Table 28. Prevalence of low anthropometric levels among rural African children by gender.

Anthropometric Indices	Girls	Boys	Both
Weight-for-Height (wasted)			
< - 2 SD	7.8%	7.9%	7.9%
	(83)	(90)	(173)
< - 3 SD	2.8%	2.6%	2.7%
	(30)	(30)	(60)
Mean	-0.10	-0.15	-0.12
Median	0.29	0.24	0.26
Standard deviation	1.28	1.12	1.26
Standardized prevalence	8.2%	8.9%	8.5%
(n)	(1070)	(1139)	(2209)
Height-for-Age (stunted)			
< - 2 SD	27.3%	32.5%	30.0%
	(241)	(308)	(549)
< - 3 SD	10.8%	12.1%	11.5%
	(95)	(115)	(210)
Mean	-1.29	-1.45	-1.37
Median	-1.28	-1.20	-1.38
Standard deviation	1.49	1.20	1.47
Standardized prevalence	41.8%	46.5%	44.2%
(n)	(882)	(947)	(1829)
Weight-for-Age (underweight)			
< - 2 SD	22.7%	22.5%	22.6%
	(207)	(221)	(428)
< - 3 SD	6.7%	7.7%	7.2%
	(61)	(76)	(137)
Mean	-0.95	-1.05	-1.00
Median	-1.01	-1.07	-1.04
Standard deviation	1.36	1.16	1.36
Standardized prevalence	33.1%	36.0%	34.6%
(n)	(913)	(982)	(1895)

also falls within an established medium prevalence category if one evaluates this ratio against a proposed set of epidemiological criteria for assessing the severity of undernutrition in a given population (Gorstein et al., 1994:274). Figure 3 graphically summarizes the W/H z-score distribution of the children in comparison to the reference population.

While wasting (or low levels of weight-for-height) does not seem to pose a serious problem, the conditions of stunting and underweight appear to do so. Standardized prevalences of 44.21 and 34.61 percent, respectively, are very high in comparison to the reference population and when viewed against above-mentioned epidemiological criteria. Figures 4 and 5 correspondingly illustrate the differences of these proportions from that of the reference group. These marked departures from the reference are also evident in the mean and/or median values on these two outcomes of low anthropometric indices. Recalling that the reference population is normally distributed and has a mean (and median) of zero, the means of height-for-age and weight-for-age indices for both girls and boys (at -1.37 and -1.00, respectively) reflect degrees of nutritional inadequacies for this particular study population.

A further examination of the anthropometric indices – particularly, weight-for-height and height-for-age – concisely captures the nutritional status of the rural African children (Table 29). Overall, 2.4 percent of all children are stunted and wasted, with more of the boys (3.2 percent) than girls (1.6 percent) experiencing this level of malnutrition. Approximately 29.4 percent, on the other hand, are stunted but not wasted, while 7.8 percent appear to be wasted but not stunted. More than half of the children (60.4 percent) are within normal nutritional levels, majority of this population being made up of girls.

From the foregoing, the finding that stands out is the high prevalence of stunting and underweight and their consistent showing as nutritional problems among the children. The picture on stunting lends credence to the earlier observations that rural Africans in general, and their households in particular, lead lives that border on extreme poverty. It will be recalled that a high prevalence of stunting has been said to be associated with low socioeconomic status (Gorstein et al., 1994:274) and has been proposed also as a measure of overall social deprivation (Ashworth and Dowler, 1990:123). The issue of being

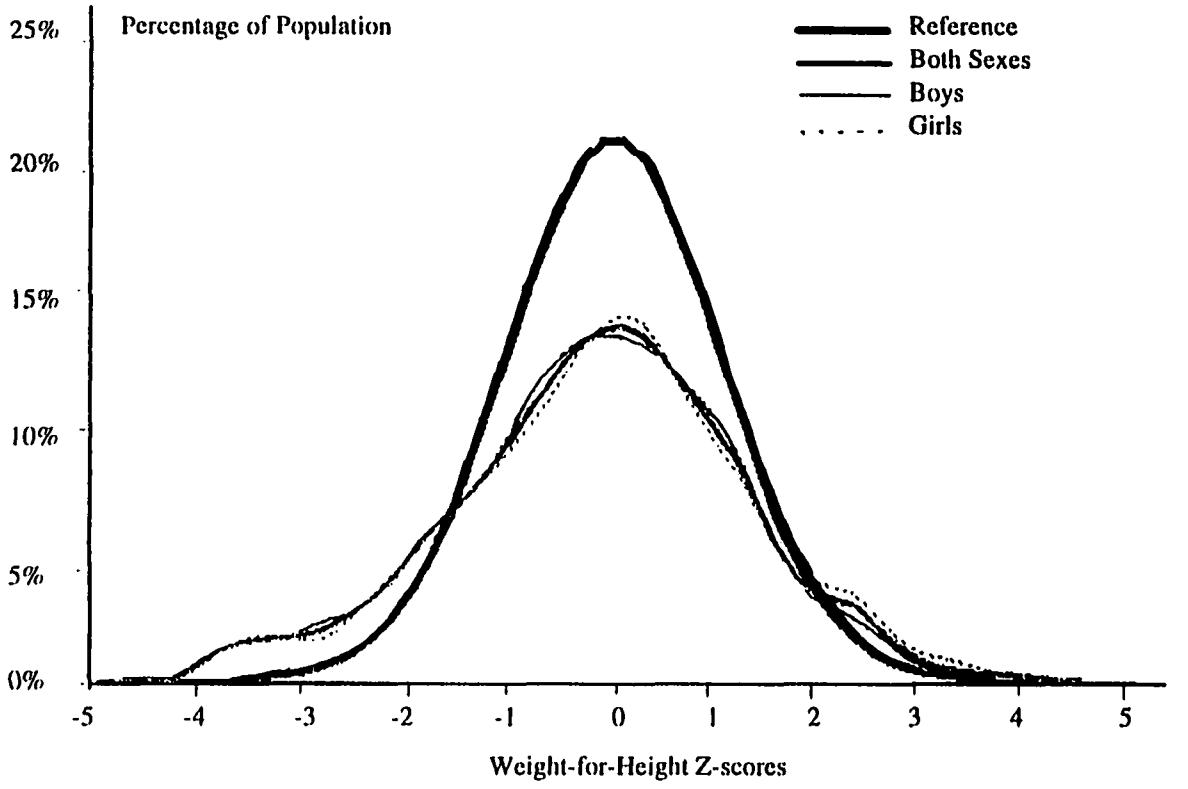

Figure 3. Weight-for-height z-score distribution of 24-72-month-old rural African children in relation to the NCHS reference population.

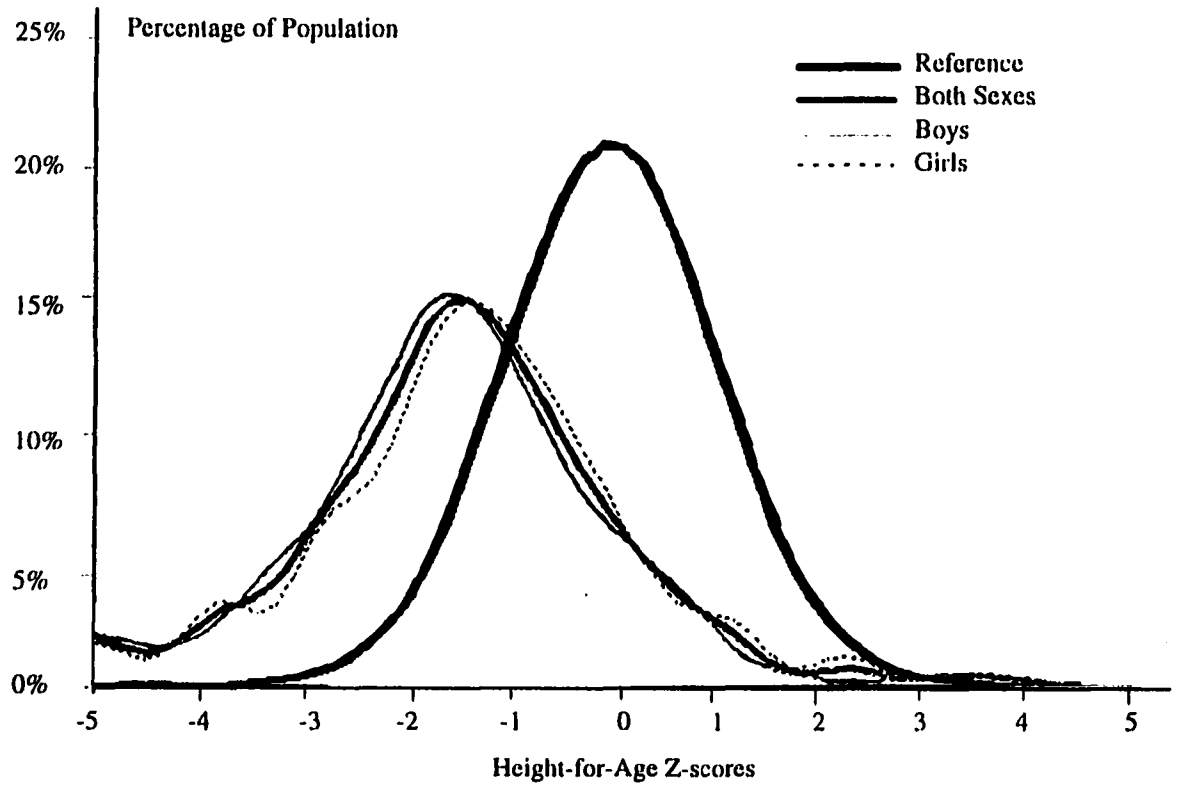

Figure 4. Height-for-age z-score distribution of 24-72-month-old rural African children in relation to the NCHS reference population.

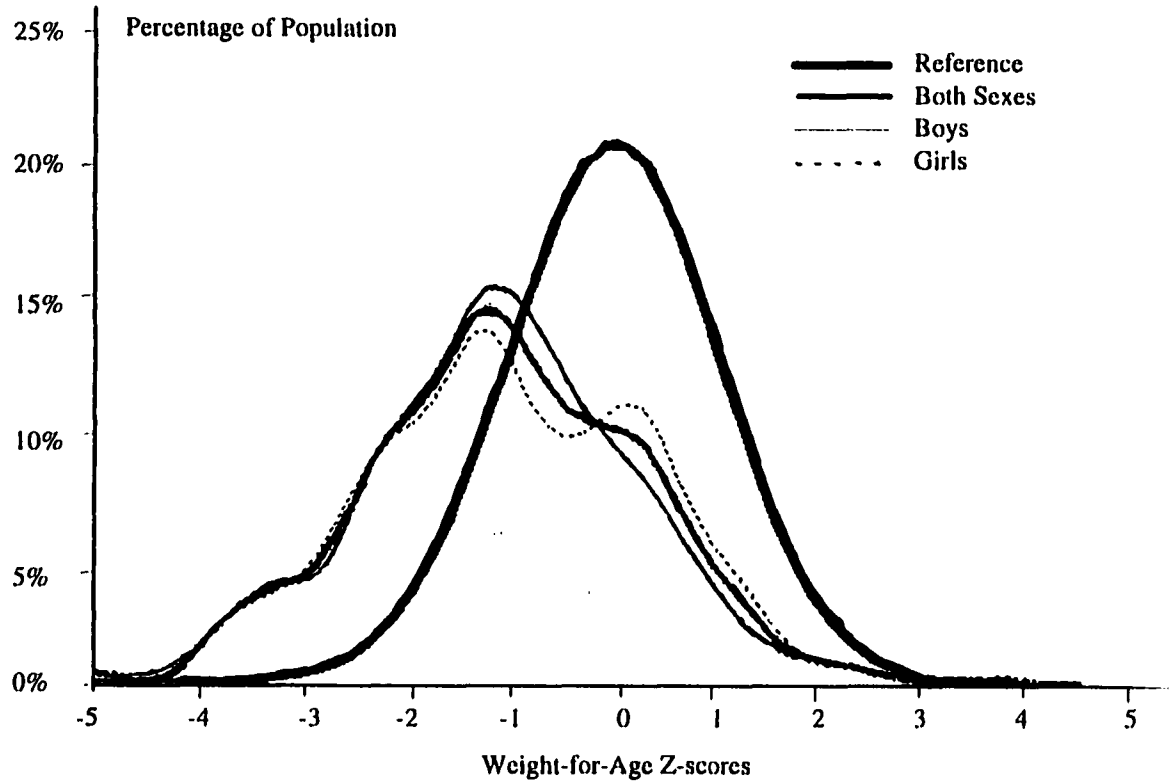

Figure 5. Weight-for-age z-score distribution of 24-72-month-old rural African children in relation to the NCHS reference population.

Table 29. Nutritional status of rural African children by weight-for-height and height-for-age anthropometric indices (individual level).

W/H Anthropometric Satus	H/A Anthropometric Status	
	< - 2 SD	≥ - 2 SD
Girls*		
< - 2 SD	1.6%	8.4%
	(13)	(68)
≥ - 2 SD	27.6%	62.4%
	(225)	(508)
Boys		
< - 2 SD	3.2%	7.3%
	(28)	(64)
≥ - 2 SD	30.9%	58.7%
	(271)	(515)
All		
< - 2 SD	2.4%	7.8%
	(41)	(132)
≥ - 2 SD	29.4%	60.4%
	(497)	(1023)

* χ^2 tests are significant at p=.000.

underweight does not suggest a similar argument. In general, the prevalence of reduced body mass among children implies the need to further assess the condition in order to determine whether it is due to wasting, stunting, or the combination of wasting and stunting (Gorstein et al., 1994:275).

The household-level data on the children's anthropometric status, as drawn from the above population, reflect the same patterns as those found at the individual level (Table 30). While seemingly marked differences obtain in the means of each anthropometric index such that the sampled child per household falls within normal nutritional levels, the t-tests done on the data did not reveal significant departures from those at the individual level. The similarity in both household and individual-level data are also seen in the distribution of girls and boys on all the anthropometric indices (Figures 6, 7, and 8). Interestingly, the derived standardized prevalences are zero on all three conditions of wasting, stunting, and underweight. This could be due to the overall pattern in the means of all three indices that, as was noted above, fall within normal nutritional levels. Placing less reliance on the computed standardized prevalences, approximately 2.4 percent of the children at the household level are wasted and stunted, about 7.9 percent are wasted but not stunted, while 28.9 percent are stunted but not wasted (Table 31). A similar proportion (as that at the individual level) of 60.8 percent appear to have adequate nutritional status. As at the individual level, the problem of stunting appears to be at the medium level of prevalence. Nonetheless, it mirrors the overall socioeconomic situation of the rural African households.

The next section explores the multivariate relationships among the household variables.

Multivariate Relationships Among the Variables

The hypothesized multivariate relationships among the above described variables have been encapsulated in the guiding hypothesis that: rural African households' nutritional well-being will be determined by the direct and indirect effects of, and potential interactions among, households' structure and characteristics, households' access-to-resource attributes, households' survival strategies, and households' income and expenditure patterns. As part of

Table 30. Household-level prevalence of low anthropometric levels among rural African children.

Anthropometric Indices	Girls	Boys	All
Weight-for-Height (wasted)			
< -2SD	7.9%	9.1%	8.6%
	(61)	(78)	(139)
< -3SD	3.0%	4.3%	3.7%
	(23)	(78)	(60)
Mean	1.53	1.48	1.50
Median	0.31	0.27	0.29
Standard deviation	3.89	2.00	3.95
Standardized prevalence	0.00	0.00	0.00
(n)	(770)	(853)	(1623)
Height-for-Age (stunted)			
< -2SD	25.3%	28.7%	27.1%
	(195)	(245)	(440)
< -3SD	11.4%	13.4%	12.4%
	(88)	(114)	(202)
Mean	0.25	0.11	0.18
Median	-1.04	-1.22	-1.14
Standard deviation	4.39	2.11	4.43
Standardized prevalence	0.00	0.00	0.00
(n)	(770)	(853)	(1623)
Weight-for-Age (underweight)			
< -2SD	18.6%	19.6%	19.1%
	(143)	(167)	(310)
< -3SD	4.9%	7.2%	6.1%
	(38)	(61)	(99)
Mean	0.71	0.61	0.66
Median	-0.58	-0.76	-0.69
Standard deviation	4.05	2.03	4.10
Standardized prevalence	0.00	0.00	0.00
(n)	(770)	(853)	(1623)

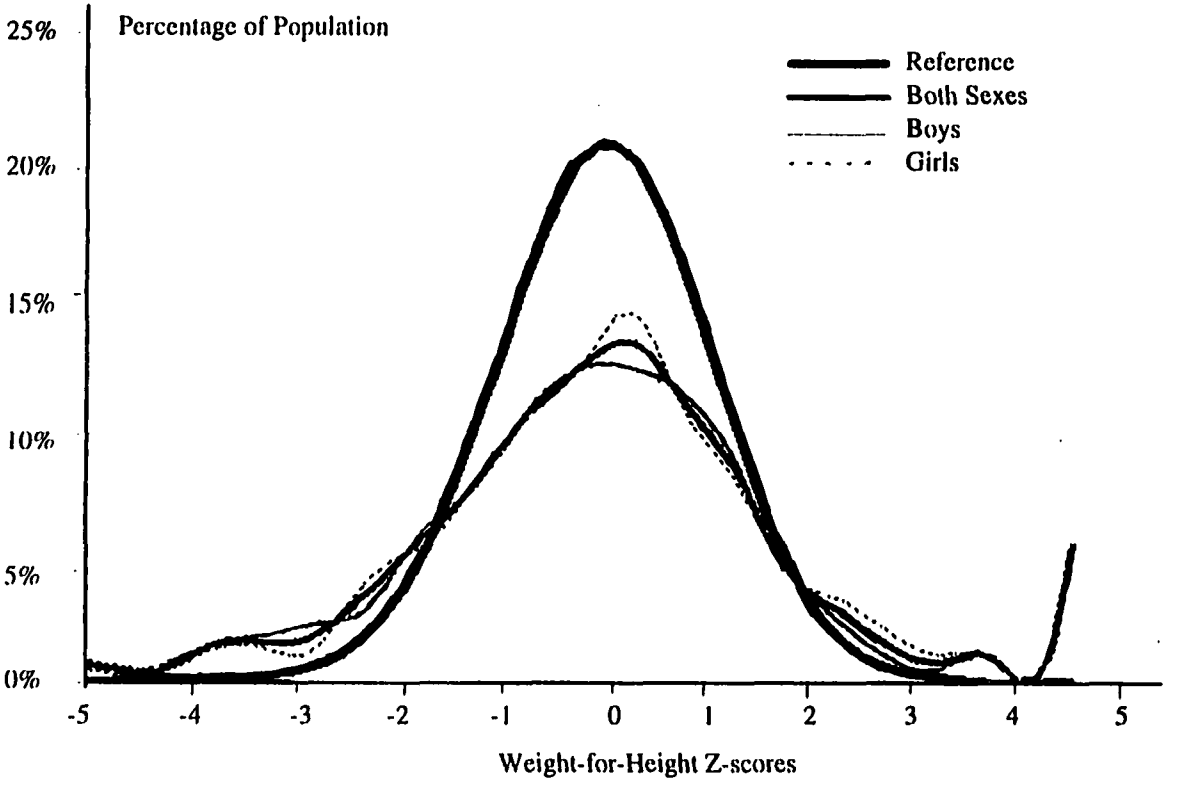

Figure 6. Household-level weight-for-height z-score distribution of 24-72-month-old rural African children in relation to the NCHS reference population.

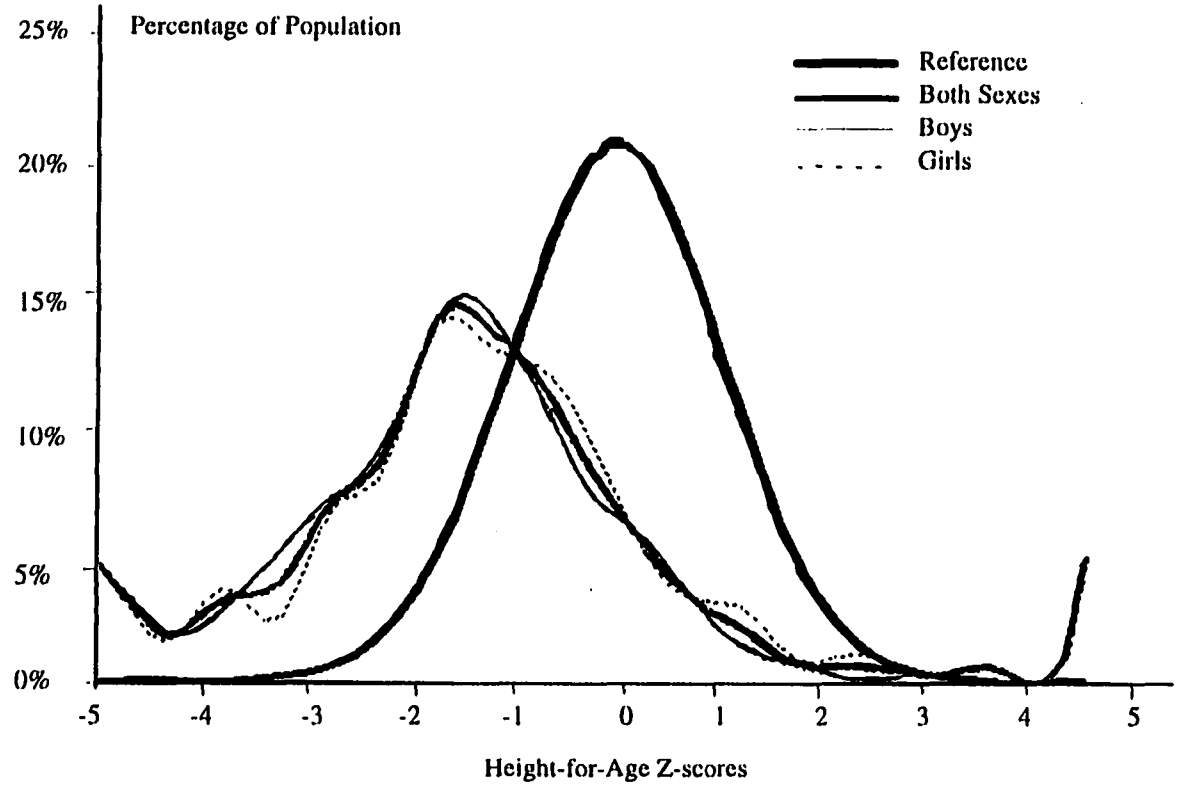

Figure 7. Household-level height-for-age z-score distribution of 24-72-month-old rural African children in relation to the NCHS reference population.

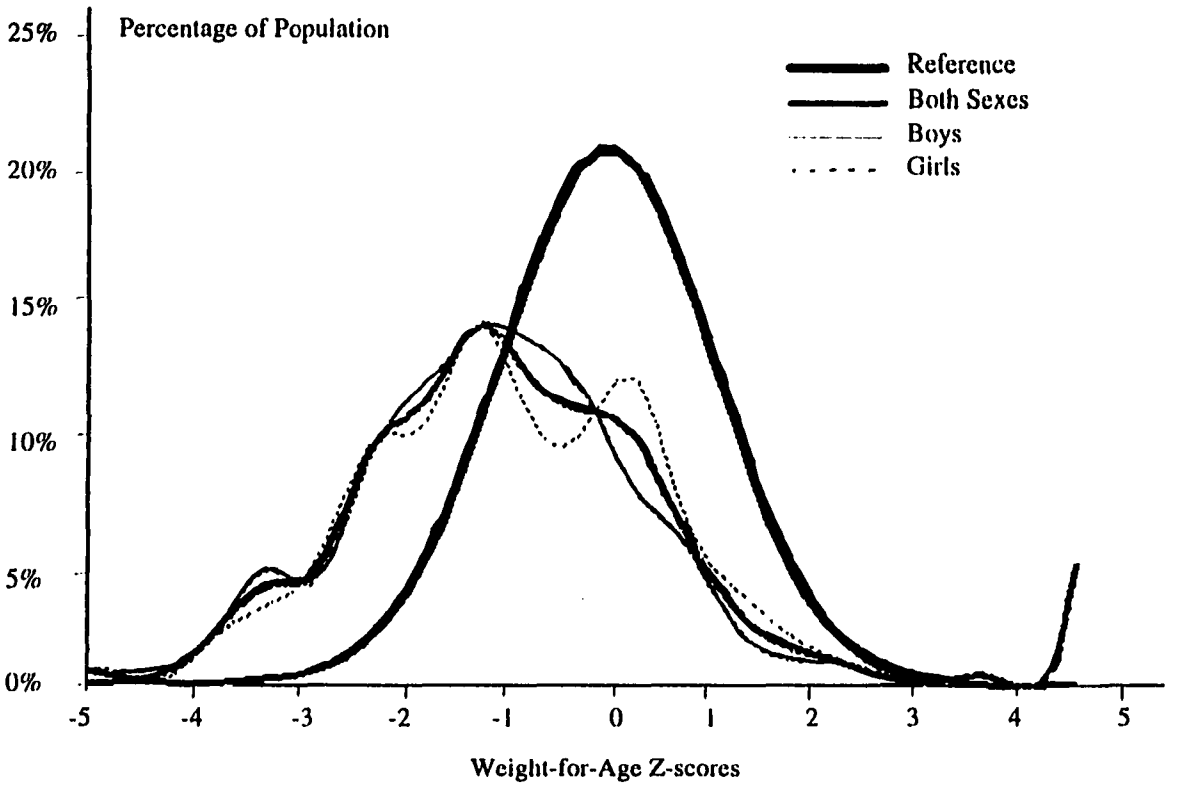

Figure 8. Household-level weight-for-age z-score distribution of 24-72-month-old rural African children in relation to the NCHS reference population.

Table 31. Household-level nutritional status of rural African children by weight-for-height and height-for-age anthropometric indices.

W/H Anthropometric Status	H/A Anthropometric Status	
	< –2 SD	≥ –2 SD
Girls*		
< –2 SD	2.0	8.3
	(12)	(49)
≥ –2 SD	28.2	61.5
	(166)	(362)
Boys		
< –2 SD	3.0	7.5
	(19)	(48)
≥ –2 SD	29.4	60.1
	(187)	(383)
All*		
< –2 SD	2.4	7.9
	(31)	(97)
≥ –2 SD	28.9	60.8
	(353)	(745)

* Significant at $p < .10$ among girls; among all, $p = .05$.

the preliminary steps in the evaluation of this hypothesis, bivariate correlations have been derived and are presented in Table 32 (Appendix E presents the bivariate correlations by gender of household head). Household characteristics that are highly related with daily caloric intake per adult equivalent include gender, age, and education of household head, the household's labor power, dependency ratio, and the number of adults employed per household. The negative direction of some of the characteristics (e.g., age of head, labor power, dependency ratio) counters the hypothesized relationships but surfaces as logical when one considers the contexts that these are set against. The transformed variable of number of food items consumed is significantly associated with all the variables except the dependency ratio. Weight-for-height as an endogenous variable, on the other hand, appears to have the education of household head, index of access to resources, and asset-oriented strategies as its key correlates. In addition to the non-head adults' mean education, the other factors associated with height-for-age are similar to those of the anthropometric index of weight-for-height.

Model estimation

One of the important patterns that surfaces from the previous discussions on the household variables – particularly food consumption patterns – is the consistent significant differences between female- and male-headed households. To a large extent, the findings provide empirical support to extant knowledge that socioeconomic differentiation is as much a product of gender differences as of measures of material wealth, education, occupation, and access to networks of kinship, friendship, and patronage. Given the findings and prevailing contentions about the central role of gender in socioeconomic differentiation (and deprivation), the variable has been anticipated to have interaction effects in predicting levels of energy intake, dietary adequacy, as well as of child anthropometry. It is in this regard that the model shown in Figure 2 was estimated separately for female-headed households and for male-headed ones. Results showed differences in the magnitude of the path coefficients for each of the household groups and the occurrence of dissimilar paths that were statistically significant. Consequently, stacked models were used to analyze each of the paths for the two household groups in order to examine significant differences in any of the model paths. In

Table 32. Bivariate correlations between the independent and dependent variables (all households).

Variables	1	2	3	4	5	6	7	8
1. AEQCALI	1.00							
2. LNFDITMS	.44**	1.00						
3. WHZ	-.02	.10**	1.00					
4. HAZ	.06*	.07*	-.27**	1.00				
5. TOTMINCI	-.00	.19**	.05	.05	1.00			
6. PMXFD	.14**	.06**	-.02	-.04	-.33**	1.00		
7. AGE	-.04*	.09**	-.01	-.05	.05**	.14**	1.00	
8. GENDRHDI	-.07**	-.09**	.01	.00	.18**	-.18**	-.17**	1.00
9. HHDSEDUC	.05**	.12**	.08**	.08**	.30**	-.30**	-.40**	.07**
10. LBRPWR	-.27**	.18**	.04	-.02	.18**	.11**	.39**	-.11**
11. DEPRATIO	.06**	-.00	-.02	-.03	-.08**	.14**	.10**	-.01
12. MNEDUC	.03	.15**	.05	.10**	.30**	-.30**	-.01	-.15**
13. HHRSRSCE2	.01	.17**	.10**	-.06*	.04**	.08**	.27**	-.07**
14. STRTGYI	.02	.16**	.07*	-.04	.04**	.08**	.26**	-.09**
15. NEMPLYD	-.13**	.11**	-.01	.07*	.40**	-.06**	.04*	.11**
16. MLTSTRTG	-.03	.13**	.06	-.02	.14**	-.00	.13*	.01

* Correlation is significant at the .05 level (two-tailed).

** Correlation is significant at the.01 level (two-tailed).

households).

	7	8	9	10	11	12	13	14	15	16
0										
4**	1.00									
8**	-.17**	1.00								
0**	-.40**	.07**	1.00							
1**	.39**	-.11**	-.12**	1.00						
4**	.10**	-.01	-.08**	-.21**	1.00					
0**	-.01	-.15**	.41**	.14**	-.18**	1.00				
8**	.27**	-.07**	-.09**	.38**	.03	.01	1.00			
8**	.26**	-.09**	-.09**	.36**	.02	.02	.92**	1.00		
6**	.04*	.11**	.03	.35**	-.19**	.08**	.15**	.18**	1.00	
0	.13*	.01	-.03	.33**	-.09**	.06**	.58**	.64**	.50**	1.00

this procedure, all the theoretically interesting paths are first 'freed' in estimating the model for the two groups. Subsequently, equality constraints (i.e., setting one path at a time as equal for both groups) are imposed to determine changes in chi-square. The resulting change in this statistic between the "all-free-parameters" estimation and that with one path set as equal becomes the basis for determining whether the path set as equal differs significantly for the two groups. Where none of the paths in the model show significant differences across the two groups, significant interaction effects do not exist such that the model in Figure 2 can be considered as adequate and that estimation for the model can be done without separating the households by gender of household head. Estimations on caloric intake and number of food items showed these interaction effects while those on anthropometry did not reveal any. While it was thus not necessary to have divided the households based on the head's gender in estimating the models for the W/H and H/A anthropometric endogenous variables, model runs on the split group were made. This was undertaken to evaluate the differential effects of the independent variables on monthly income, percent of expenditure allocated to food, and on anthropometric status.

Tables 33-40 present summaries of model estimations for each endogenous variable as derived from the procedures outlined above. Results for each endogenous variable estimation are briefly described below.

Hypothesis testing

Levels of household daily caloric intake per adult equivalent. The statistics generated regarding the model fit on this estimation provide mixed results (Table 33). Chi-square as an overall measure of model fit is significant across the two household groups(χ^2=72.91, degrees of freedom=24). However, the goodness of fit indices at 0.992 and 0.993 for female- and male-headed units, respectively, indicate that the model fits the data sufficiently well. All the predictor variables included in the estimation explain about half (R^2=48.8 percent for each group) of the variance in each group's level of daily caloric intake.

As one of the intervening variables in determining caloric intake, household income is significantly explained by the head's age and education, the household's labor power, the non-head adults' education, and the number of adults employed per household. The total

Table 33. Maximum Likelihood estimates and estimates of model fit for female- and male-headed households (calorie intake as dependent variable).

Explanatory Variables	Female-headed	Male-headed	χ^2 (df)	$\Delta\chi^2$ (1)
Theoretically Interesting Model	–	–	$72.91_{(24)}$	–
Household Income				
γ_{11} (head's age-income)	.136*	.133*	$72.91_{(25)}$	0.00
γ_{12} (head's education-income)	.288*	.304*	$73.01_{(25)}$	0.10
γ_{13} (labor power-income)	.123*	.069*	$74.14_{(25)}$	1.23
γ_{14} (dependency ratio-income)	.065	.028	$73.65_{(25)}$	0.74
γ_{15} (non-head adults' education-income)	.180*	.206*	$73.21_{(25)}$	0.30
γ_{16} (index of access to resources-income)	.093	-.130	$77.69_{(25)}$	4.78*
γ_{17} (index of asset-oriented strategy-income)	-.099	.116	$76.86_{(25)}$	3.95*
γ_{18} (index of employment strategy-income)	.429*	.354*	$75.20_{(25)}$	2.29
γ_{19} (index of multiple strategy-income)	-.131*	-.060	$74.19_{(25)}$	1.28
Percent of Monthly Expenditure on Food				
γ_{22} (head's education- food expenditure)	-.112*	-.193*	$75.69_{(25)}$	2.78
γ_{24} (dependency ratio-food expenditure)	.100*	.084*	$73.03_{(25)}$	0.12
γ_{25} (non-head adults' education-food expenditure)	-.186*	-.191*	$72.92_{(25)}$	0.01
β_{21} (income-food expenditure)	-.267*	-.267*	$72.91_{(25)}$	0.00
Daily Caloric Intake per Adult Equivalent				
γ_{31} (head's age-calorie intake)	.047	.099*	$73.83_{(25)}$	0.92
γ_{32} (head's education-calorie intake)	.038	.178*	$78.98_{(25)}$	6.07*
γ_{33} (labor power-calorie intake)	-.399*	-.234*	$83.41_{(25)}$	10.50*
γ_{34} (dependency ratio-calorie intake)	-.045	.013	$74.30_{(25)}$	1.39
γ_{35} (non-head adults' education-calorie intake)	.006	.120*	$77.52_{(25)}$	4.61*
β_{32} (food expenditure-calorie intake)	.159*	.159*	$72.91_{(25)}$	0.00
R^2	.479	.484	–	–
$\chi^2_{(24)} = 72.91$ (p =.000)				
Goodness of Fit Index	.992	.993	–	–
(n =)	(650)	(968)	–	–

* Significant at 0.05 level.

$\Delta\chi$ = change in chi-square.

df = degrees of freedom

effect of each of these is fairly modest (see also Table 41), with employment-based strategy apparently providing the largest contribution (β=0.43 and β=0.35 for female- and male-headed households, respectively). For female-headed households, the dependence on multiple strategies appears to negatively contribute to their income levels. Recalling that asset-oriented strategies form an important component of female-headed units' livelihood mechanisms, the finding substantiates a contention of this study that there is little cash or in-kind income to be derived from the resources that they have. Strengthening this argument is the observed interaction effects of the head's gender on access to resources and asset-oriented strategies. The implication is that gender-based differences do exist in terms of access to resources and harnessing these resources as a survival strategy to attain a level of household income. That is, while fewer of the male-headed households have access to resources, those who do are more likely to generate greater income from it. Conversely, while more of the female-headed households have access to resources, their meager resources (e.g., size of land, number of livestock holdings) are likely to negatively impact on their income in the long run as they harness these assets for their survival.

As a second mediating variable to attaining adequate levels of caloric intake, percent of monthly allocations for food appear to be significantly determined by all the variables hypothesized to directly bear on it, to wit: the head's education, dependency ratio, non-head adults' mean education, and the household's level of income (see also Table 42). The interesting pattern is that, except for dependency ratio, the variables' direct effects on food expenditure are negative, suggesting that education does not necessarily shape desired caloric intake levels – at least in the context of rural African households. The findings on income and food expenditure are perhaps not totally unexpected as these are simply an application of Engel's law: as household income increases, relative expenditures on food decreases (Foster, 1992:117).

Levels of caloric intake per adult equivalent have varying direct determinants in female- and male-headed households (see Figure 9 where parenthesized parameter estimates are the male-headed units). That is, apart from labor power and food expenditure that are common to both households as significant predictors, the male head's age and education, as

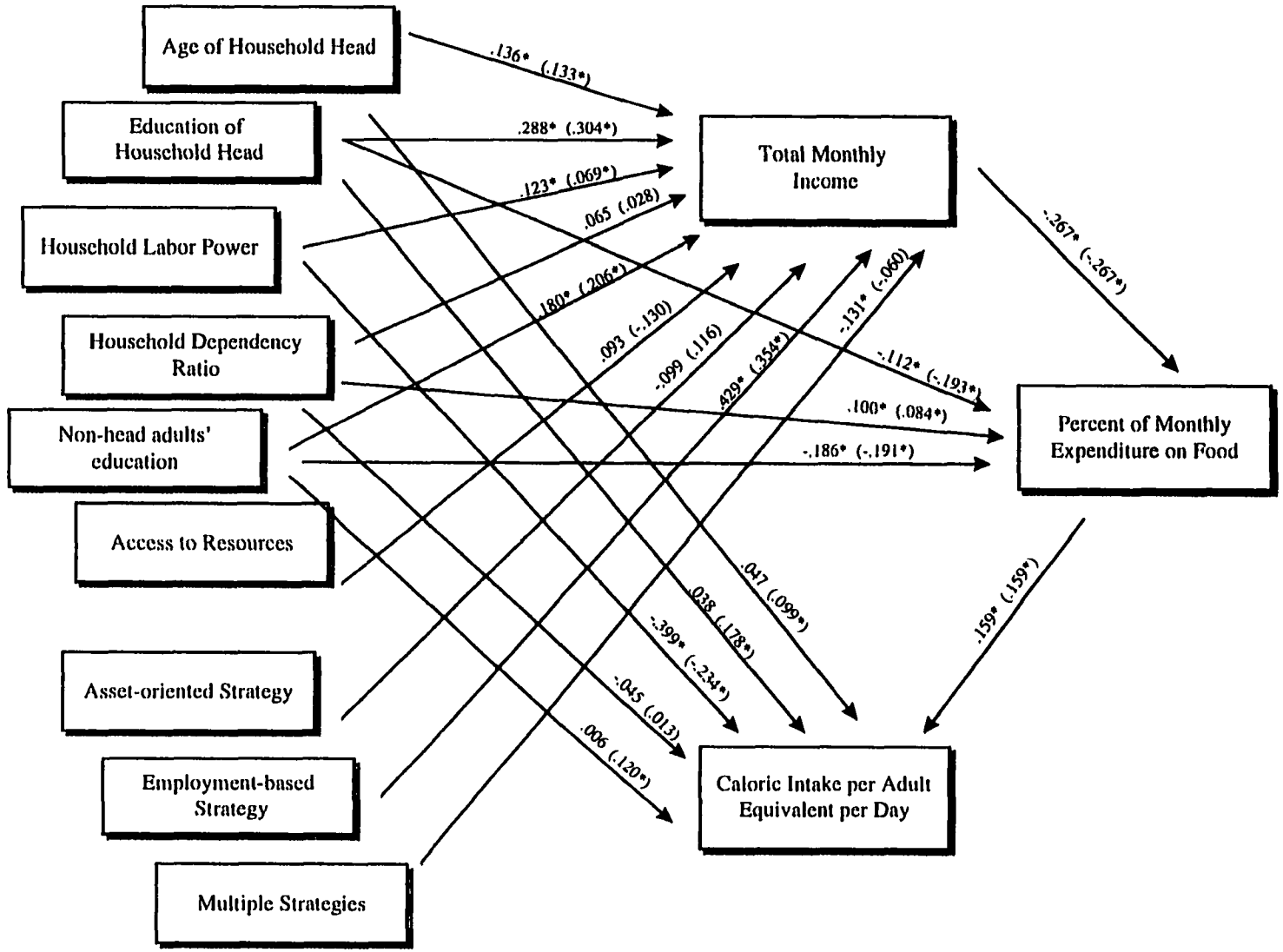

Figure 9. Direct and indirect effects of household characteristics and survival strategies on caloric intake.

well as the non-head adults' levels of formal schooling, seem to determine as well the levels of caloric intake in male-headed units. Again, however, the gender of household head engenders differences in energy intake levels. Seemingly, higher levels of intake is a function of the head's higher educational levels but this holds only for male-headed units. Similarly, energy intake is determined by non-head adults' education but this relationship applies only to female-headed households. And, while both households' labor power negatively impact on caloric intake, only in female-headed households does this negative effect create an adverse influence on levels of energy or calorie consumption.

In addition to the household characteristics shown above as having direct significant effects on calorie intake levels, the other variables that also contribute to this measure of food consumption are the number of adults employed per household and income and, in female-headed households, the application of multiple strategies (Table 34). The effects of these variables, albeit modest (β's ranging from -.042 to .006) and indirect, are significant and contribute to the total picture of the factors that critically shape energy consumption.

Number of food items. The pattern that can be drawn from the model estimation on the transformed endogenous variable of number of food items consumed closely resembles those that obtain for levels of caloric intake. The model fit in terms of the chi-square measure (χ^2=81.49, df=24) is significant but the goodness of fit indices show that the model fits the data rather well (Table 35). Interestingly, the variance explained by the exogenous variables in male-headed households are higher than that in female-headed ones at 48 and 42 percent, respectively. The difference seems to be due to the fact that there are two more paths that showed significance in the former compared to the latter (Figure 10). Reiterating the findings in the model estimation for caloric intake levels, the significant determinants of income as a mediating variable of (the natural logarithm) of number of food items are the head's age and education, the household's labor power, non-head adults' education, and the number of adults employed per household (see also Table 41). The interaction effects observed apply only to access to resources which suggests that only in female-headed households does such an access contribute to income. The significant factors contributing to the two household groups' monthly expenditures for food are also similar to that obtained

Table 34. Total, direct, and indirect effects of household characteristics and survival strategies on caloric intake.

Explanatory Variables	Total Effects [a]	Direct Effects [a]	Indirect Effects via Income and/ or Expenditure [a]
Female-headed Households			
Household head's age	.041 (.040)	.047 (.040)	-.006 (.002)*
Household head's education	.008 (.042)	.038 (.041)	-.030 (.008)*
Household labor power	-.404 (.037)*	-.399 (.037)*	-.005 (.002)*
Dependency ratio	-.032 (.038)	-.045 (.038)	.013 (.006)*
Non-head adults' education	-.031 (.039)	.006 (.039)	-.037 (.009)*
Access to resources	-.004 (.003)	–	-.004 (.003)
Asset-oriented strategy	.004 (.003)	–	.004 (.003)
Employment-based strategy	-.018 (.004)*	–	-.018 (.004)*
Multidimensional strategy	.006 (.002)*	–	.006 (.002)*
Income	-.042 (.008)*	–	-.042 (.008)*
Food Expenditure	.159 (.026)*	.159 (.026)*	–
Male-headed Households			
Household head's age	.093 (.040)*	.099 (.037)*	-.006 (.002)*
Household head's education	.134 (.042)*	.178 (.040)*	-.044 (.009)*
Household labor power	-.237 (.037)*	-.234 (.035)*	-.003 (.002)
Dependency ratio	.025 (.038)	.013 (.032)	.012 (.006)*
Non-head adults' education	.081 (.039)*	.120 (.038)*	-.039 (.009)*
Access to resources	.006 (.003)*	–	.006 (.003)*
Asset-oriented strategy	-.005 (.004)	–	-.005 (.004)
Employment-based strategy	-.015 (.003)*	–	-.015 (.003)*
Multidimensional strategy	.003 (.002)	–	.003 (.002)
Income	-.042 (.008)*	–	-.042 (.008)*
Food Expenditure	.159 (.026)*	.159 (.026)*	–

* Significant at 0.05 level.

[a] Figures in parentheses are standard errors.

Table 35. Maximum Likelihood estimates and estimates of model fit for female- and male-headed households (natural logarithm of number of food items as dependent variable).

Explanatory Variables	Female-headed	Male-headed	$\chi^2_{(df)}$	$\Delta\chi^2_{(1)}$
Theoretically Interesting Model	–	–	$81.49_{(24)}$	–
Household Income				
γ_{11} (head's age-income)	.138*	.135*	$81.49_{(25)}$	0.00
γ_{12} (head's education-income)	.284*	.313*	$81.83_{(25)}$	0.34
γ_{13} (labor power-income)	.121*	.079*	$82.89_{(25)}$	0.80
γ_{14} (dependency ratio-income)	.060	.025	$82.14_{(25)}$	0.65
γ_{15} (non-head adults' education-income)	.175*	.201*	$81.82_{(25)}$	0.33
γ_{16} (index of access to resources-income)	.087	-.120	$85.70_{(25)}$	4.21*
γ_{17} (index of asset-oriented strategy-income)	-.093	.109	$85.06_{(25)}$	3.57*
γ_{18} (index of employment strategy-income)	.429*	.353*	$83.89_{(25)}$	2.40
γ_{19} (index of multiple strategy-income)	-.131*	-.063	$82.71_{(25)}$	1.22
Percent of Monthly Expenditure on Food				
γ_{22} (head's education- food expenditure)	-.120*	-.199*	$84.26_{(25)}$	2.77
γ_{24} (dependency ratio-food expenditure)	.092*	.080*	$81.56_{(25)}$	0.07
γ_{25} (non-head adults' education-food expenditure)	-.188*	-.188*	$81.49_{(25)}$	0.00
β_{21} (income-food expenditure)	- .266*	-.266*	$81.49_{(25)}$	0.00
Number of Food Items				
γ_{31} (head's age-food items)	.024	.021	$81.49_{(25)}$	0.00
γ_{32} (head's education-food items)	.222*	.185*	$81.89_{(25)}$	0.40
γ_{33} (labor power-food items)	.098*	.137*	$82.06_{(25)}$	0.57
γ_{34} (dependency ratio-food items)	.006	.086*	$83.95_{(25)}$	2.46
γ_{35} (non-head adults' education-food items)	.078	.152*	$83.35_{(25)}$	1.86
β_{32} (food expenditure-food items)	.095*	.095*	$81.49_{(25)}$	0.00
R^2	.418	.478	–	–
$\chi^2_{(24)} = 81.49$ (p =.000)				
Goodness of Fit Index	.995	.990	–	–
(n =)	(673)	(989)	–	–

* Significant at 0.05 level.

$\Delta\chi$ = change in chi-square.

df = degrees of freedom

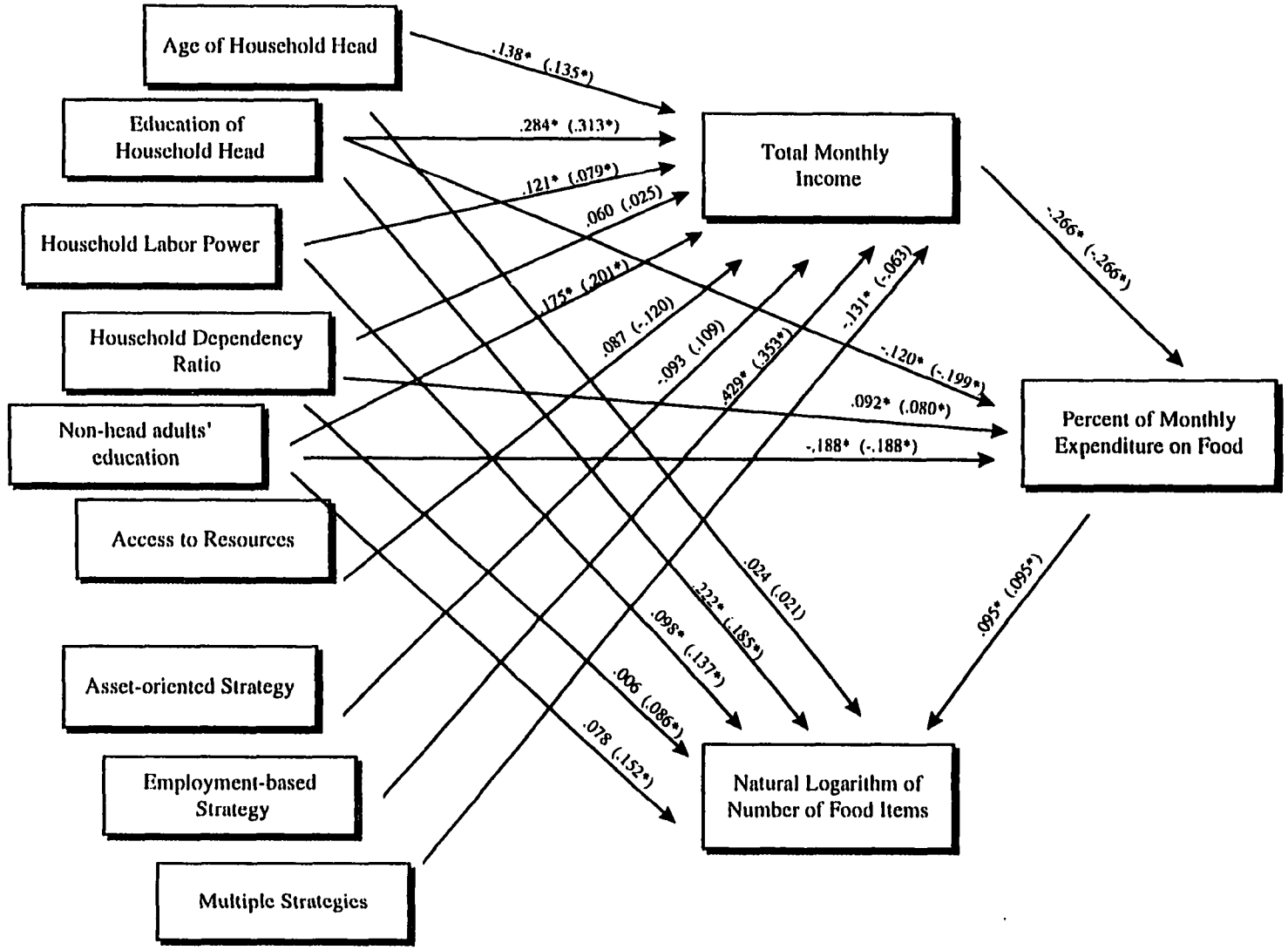

Figure 10. Direct and indirect effects of household characteristics and survival strategies on natural logarithm of number of food items.

from the caloric intake model estimation. These are the head's education, dependency ratio, non-head adults' education, and income. The direction of these factors' contributions to food expenditure is likewise negative and, as such, appears to uphold the earlier advanced explanation.

The key factors that account for dietary diversity (or number of food items consumed) are not exactly similar to those on caloric intake (Table 36). On this endogenous variable, the use of a multidimensional strategy in female-headed households does not show up as a having a significant indirect effect on a household's dietary adequacy. In households with male heads, dependency ratio in addition to male head's education and their non-head adults' education appears to also positively contribute to these units' dietary diversity.

Child anthropometric status. The discussion of the findings on these two endogenous variables is being combined due to the similar results obtained from their separate estimations. In both, chi-square measures and goodness of fit indices point to the good fit of the model on the data (Tables 37 to 40). About 40 percent of the hypothesized variables in female-headed households explain the variance in children's weight-for-height (W/H) and height-for-age (H/A). In male-headed units, about 41 percent of the specified variables explain the levels attained by the 24-72 month-old children on the two anthropometric parameters.

Model estimations with W/H and H/A as dependent variables show that across female- and male-headed households, the key elements shaping monthly income levels are the household head's age and education, the non-head adults' education, and the number of adults employed per household (see also Table 41). All four household characteristics contribute positively to the levels of income attained, with β's (beta's) ranging from 0.129 to 0.431. In male-headed households, an added significant factor to increasing income is their labor power, suggesting that despite lower units on this variable (3.82 as opposed to female-headed households' 4.39 in Table 7), more of these households' manpower are able to contribute to improving income levels.

The percent of monthly allocations on food as a mediating variable in shaping W/H and H/A are negatively influenced by the education of the household head and the non-head

Table 36. Total, direct, and indirect effects of household characteristics and survival strategies on natural logarithm of number of food items.

Explanatory Variables	Total Effects [a]	Direct Effects [a]	Indirect Effects via Income and/ or Expenditure [a]
Female-headed Households			
Household head's age	.021 (.042)	.024 (.042)	-.003 (.001)
Household head's education	.203 (.043)*	.222 (.044)*	-.019 (.006)*
Household labor power	.095 (.038)*	.098 (.038)*	-.003 (.001)*
Dependency ratio	.013 (.040)	.006 (.040)	.007 (.004)*
Non-head adults' education	.056 (.040)	.078 (.041)	-.022 (.007)*
Access to resources	-.002 (.002)	–	-.002 (.002)
Asset-oriented strategy	.002 (.002)	–	.002 (.002)
Employment-based strategy	-.011 (.003)*	–	-.011 (.003)*
Multidimensional strategy	.003 (.002)*	–	.003 (.002)*
Income	-.025 (.007)*	–	-.025 (.007)*
Food Expenditure	.095 (.026)*	.095 (.026)*	–
Male-headed Households			
Household head's age	.018 (.042)	.021 (.037)	-.003 (.001)*
Household head's education	.158 (.043)*	.185 (.040)*	-.027 (.008)*
Household labor power	.135 (.038)*	.137 (.035)*	-.002 (.001)
Dependency ratio	.093 (.040)*	.086 (.032)*	.007 (.004)
Non-head adults' education	.129 (.040)*	.152 (.037)*	-.023 (.007)*
Access to resources	.003 (.002)	–	.003 (.002)
Asset-oriented strategy	-.003 (.002)	–	-.003 (.002)
Employment-based strategy	-.009 (.003)*	–	-.009 (.003)*
Multidimensional strategy	.002 (.001)*	–	.002 (.001)
Income	-.025 (.007)*	–	-.025 (.007)*
Food Expenditure	.095 (.026)*	.095 (.026)*	–

* Significant at 0.05 level.

[a] Figures in parentheses are standard errors.

Table 37. Maximum Likelihood estimates and estimates of model fit for female- and male-headed households (weight-for-height as dependent variable).

Explanatory Variables	Female-headed	Male-headed	χ^2 (df)	$\Delta\chi^2$ (1)
Theoretically Interesting Model	–	–	$37.72_{(24)}$	–
Household Income				
γ_{11} (head's age-income)	.129*	.175*	$38.06_{(25)}$	0.34
γ_{12} (head's education-income)	.200*	.315*	$39.95_{(25)}$	2.23
γ_{13} (labor power-income)	.116	.152*	$37.94_{(25)}$	0.22
γ_{14} (dependency ratio-income)	.109	.038	$38.76_{(25)}$	1.04
γ_{15} (non-head adults' education-income)	.213*	.184*	$37.89_{(25)}$	0.17
γ_{16} (index of access to resources-income)	.180	-.015	$39.46_{(25)}$	1.74
γ_{17} (index of asset-oriented strategy-income)	-.114	.036	$38.65_{(25)}$	0.93
γ_{18} (index of employment strategy-income)	.431*	.299*	$41.08_{(25)}$	3.36
γ_{19} (index of multiple strategy-income)	-.104	-.066	$37.89_{(25)}$	0.17
Percent of Monthly Expenditure on Food				
γ_{22} (head's education- food expenditure)	-.124*	-.205*	$38.91_{(25)}$	1.19
γ_{24} (dependency ratio-food expenditure)	.095	.059	$37.97_{(25)}$	0.25
γ_{25} (non-head adults' education-food expenditure)	-.176*	-.207*	$37.88_{(25)}$	0.16
β_{21} (income-food expenditure)	-.201*	- .201*	$37.72_{(25)}$	0.00
Weight-for-Height				
γ_{31} (head's age-weight-for-height)	-.113	-.023	$38.65_{(25)}$	0.93
γ_{32} (head's education-weight-for-height)	.037	.101	$38.22_{(25)}$	0.50
γ_{33} (labor power-weight-for-height)	.111	.077	$37.87_{(25)}$	0.15
γ_{34} (dependency ratio-weight-for-height)	.035	.023	$37.74_{(25)}$	0.02
γ_{35} (non-head adults' education-weight-for-height)	.080	.003	$38.55_{(25)}$	0.83
β_{32} (food expenditure-weight-for-height)	-.014	-.014	$37.72_{(25)}$	0.00
R^2	.400	.407	–	–
$\chi^2_{(24)} = 37.72$ (p =.037)				
Goodness of Fit Index	.994	.990	–	–
(n =)	(280)	(473)	–	–

* Significant at 0.05 level.

$\Delta\chi$ = change in chi-square.

df = degrees of freedom

Table 38. Total, direct, and indirect effects of household characteristics and survival strategies on weight-for-height nutritional status.

Explanatory Variables	Total Effects [a]	Direct Effects [a]	Indirect Effects via Income and/ or Expenditure [a]
Female-headed Households			
Household head's age	-.113 (.074)	-.113 (.074)	.000 (.001)
Household head's education	.039 (.072)	.037 (.072)	.002 (.007)
Household labor power	.111 (.066)	.111 (.066)	.000 (.001)
Dependency ratio	.034 (.066)	.035 (.066)	-.001 (.003)
Non-head adults' education	.083 (.066)	.080 (.067)	.003 (.009)
Access to resources	.001 (.001)	–	.001 (.001)
Asset-oriented strategy	.000 (.001)	–	.000 (.001)
Employment-based strategy	.001 (.003)	–	.001 (.003)
Multidimensional strategy	.000 (.001)	–	.000 (.001)
Income	.003 (.008)	–	.003 (.008)
Food Expenditure	-.014 (.040)	-.014 (.040)	–
Male-headed Households			
Household head's age	-.023 (.074)	-.023 (.057)	.000 (.001)
Household head's education	.105 (.072)	.101 (.059)	.004 (.011)
Household labor power	.077 (.066)	.077 (.055)	.000 (.001)
Dependency ratio	.022 (.066)	.023 (.049)	-.001 (.002)
Non-head adults' education	.006 (.066)	.003 (.055)	.003 (.010)
Access to resources	.000 (.000)	–	.000 (.000)
Asset-oriented strategy	.000 (.000)	–	.000 (.000)
Employment-based strategy	.001 (.002)	–	.001 (.002)
Multidimensional strategy	.000 (.001)	–	.000 (.001)
Income	.003 (.008)	–	.003 (.008)
Food Expenditure	-.014 (.040)	-.014 (.040)	–

* Significant at 0.05 level.

[a] Figures in parentheses are standard errors.

Table 39. Maximum Likelihood estimates and estimates of model fit for female- and male-headed households (height-for-age as dependent variable).

Explanatory Variables	Female-headed	Male-headed	$\chi^2_{(df)}$	$\Delta\chi^2_{(1)}$
Theoretically Interesting Model	–	–	$38.52_{(24)}$	–
Household Income				
γ_{11} (head's age-income)	.131*	.177*	$38.86_{(25)}$	0.34
γ_{12} (head's education-income)	.200*	.314*	$40.77_{(25)}$	2.25
γ_{13} (labor power-income)	.114	.153*	$38.79_{(25)}$	0.27
γ_{14} (dependency ratio-income)	.108	.046	$39.33_{(25)}$	0.81
γ_{15} (non-head adults' education-income)	.211*	.183*	$38.68_{(25)}$	0.16
γ_{16} (index of access to resources-income)	.180	-.018	$40.34_{(25)}$	1.82
γ_{17} (index of asset-oriented strategy-income)	-.114	.041	$39.53_{(25)}$	1.01
γ_{18} (index of employment strategy-income)	.430*	.302*	$41.67_{(25)}$	3.15
γ_{19} (index of multiple strategy-income)	-.103	.067	$38.68_{(25)}$	0.16
Percent of Monthly Expenditure on Food				
γ_{22} (head's education- food expenditure)	-.127*	-.209*	$39.78_{(25)}$	1.26
γ_{24} (dependency ratio-food expenditure)	.093	.062	$38.72_{(25)}$	0.20
γ_{25} (non-head adults' education-food expenditure)	-.180*	-.205*	$38.63_{(25)}$	0.11
β_{21} (income-food expenditure)	-.200*	-.200*	$38.52_{(25)}$	0.00
Height-for-Age				
γ_{31} (head's age-height-for-age)	-.143	.022	$41.73_{(25)}$	3.21
γ_{32} (head's education-height-for-age)	-.062	.042	$39.83_{(25)}$	1.31
γ_{33} (labor power-height-for-age)	-.047	-.031	$38.56_{(25)}$	0.04
γ_{34} (dependency ratio-height-for-age)	.006	-.022	$38.64_{(25)}$	0.12
γ_{35} (non-head adults' education-height-for-age)	.080	.087	$38.53_{(25)}$	0.01
β_{32} (food expenditure-height-for-age)	.024	.024	$38.52_{(25)}$	0.00
R^2	.400	.409	–	–
$\chi^2_{(24)} = 38.52$ (p =.031)				
Goodness of Fit Index	.994	.990	–	–
(n =)	(283)	(478)	–	–

* Significant at 0.05 level.

$\Delta\chi$ = change in chi-square.

df = degrees of freedom

Table 40. Total, direct, and indirect effects of household characteristics and survival strategies on height-for-age nutritional status.

Explanatory Variables	Total Effects [a]	Direct Effects [a]	Indirect Effects via Income and/ or Expenditure [a]
Female-headed Households			
Household head's age	-.144 (.073)	-.143 (.073)	-.001 (.001)
Household head's education	-.066 (.071)	-.062 (.072)	-.004 (.007)
Household labor power	-.048 (.065)	-.047 (.065)	-.001 (.001)
Dependency ratio	.008 (.065)	.006 (.065)	.002 (.003)
Non-head adults' education	.075 (.065)	.080 (.066)	-.005 (.009)
Access to resources	-.001 (.002)	–	-.001 (.002)
Asset-oriented strategy	.001 (.001)	–	.001 (.001)
Employment-based strategy	-.002 (.003)	–	-.002 (.003)
Multidimensional strategy	.001 (.001)	–	.001 (.001)
Income	-.005 (.008)	–	-.005 (.008)
Food Expenditure	.024 (.040)	.024 (.040)	–
Male-headed Households			
Household head's age	.021 (.073)	.022 (.057)	-.001 (.001)
Household head's education	.035 (.071)	.042 (.058)	-.007 (.011)
Household labor power	-.032 (.065)	-.031 (.055)	-.001 (.001)
Dependency ratio	-.021 (.065)	-.022 (.049)	.001 (.003)
Non-head adults' education	.081 (.065)	.087 (.055)	-.006 (.010)
Access to resources	.000 (.001)	–	.000 (.001)
Asset-oriented strategy	.000 (.001)	–	.000 (.001)
Employment-based strategy	-.001 (.002)	–	-.001 (.002)
Multidimensional strategy	.000 (.001)	–	.000 (.001)
Income	-.005 (.008)	–	-.005 (.008)
Food Expenditure	.024 (.040)	.024 (.040)	–

* Significant at 0.05 level.

[a] Figures in parentheses are standard errors.

Table 41. Total effects of household characteristics and survival strategies on monthly household income.

Explanatory Variables	Daily caloric Intake per Adult Equivalent [a]	Natural Logarithm of Number of Food Items [a]	Weight-for-Height Anthropo-metric Status [a]	Height-for-Age Anthropo-metric Status [a]
Female-headed Households				
Household head's age	.136 (.036)*	.138 (.036)*	.131 (.061)*	.129 (.062)*
Household head's education	.288 (.038)*	.284 (.037)*	.200 (.060)*	.200 (.060)*
Household labor power	.123 (.036)*	.121 (.036)*	.114 (.060)	.116 (.061)
Dependency ratio	.065 (.034)	.060 (.034)	.108 (.055)	.109 (.055)
Non-head adults' education	.180 (.035)*	.175 (.034)*	.211 (.055)*	.213 (.055)*
Access to resources	.093 (.076)	.087 (.075)	.180 (.104)	.180 (.105)
Asset-oriented strategy	-.099 (.080)	-.093 (.079)	-.114 (.111)	-.114 (.112)
Employment-based strategy	.429 (.040)*	.429 (.039)*	.430 (.057)*	.431 (.058)*
Multidimensional strategy	-.131 (.049)*	-.131 (.049)*	-.103 (.071)	-.104 (.072)
Male-headed Households				
Household head's age	.133 (.036)*	.135 (.036)*	.177 (.061)*	.175 (.062)*
Household head's education	.304 (.038)*	.313 (.037)*	.314 (.060)*	.315 (.060)*
Household labor power	.069 (.036)	.079 (.036)*	.153 (.060)*	.152 (.061)*
Dependency ratio	.028 (.034)	.025 (.034)	.046 (.055)	.038 (.055)
Non-head adults' education	.206 (.035)*	.201 (.034)*	.183 (.055)*	.184 (.055)*
Access to resources	-.130 (.076)	-.120 (.075)	-.018 (.104)	-.015 (.105)
Asset-oriented strategy	.116 (.080)	.109 (.079)	.041 (.111)	.036 (.112)
Employment-based strategy	.354 (.040)*	.353 (.039)*	.302 (.057)*	.299 (.058)*
Multidimensional strategy	-.060 (.049)	-.063 (.049)	.067 (.071)	-.066 (.072)

* Significant at 0.05 level.

[a] Figures in parentheses are standard errors.

Table 42. Total effects of household characteristics, survival strategies, and income on percent of expenditure on food.

Explanatory Variables	Daily caloric Intake per Adult Equivalent [a]	Natural Logarithm of Number of Food Items [a]	Weight-for-Height Anthropo-metric Status [a]	Height-for-Age Anthropo-metric Status [a]
Female-headed Households				
Household head's age	-.036 (.010)*	-.037 (.010)*	-.026 (.013)*	-.026 (.013)*
Household head's education	.189 (.039)*	-.195 (.038)*	-.167 (.059)*	-.165 (.059)*
Household labor power	-.033 (.010)*	-.032 (.010)*	-.023 (.013)	-.023 (.013)
Dependency ratio	.083 (.037)*	.076 (.037)*	.072 (.059)	.073 (.059)
Non-head adults' education	-.234 (.039)*	-.235 (.038)*	-.222 (.061)*	-.219 (.061)*
Access to resources	-.025 (.020)	-.023 (.020)	-.036 (.022)	-.036 (.022)
Asset-oriented strategy	.026 (.022)	.025 (.021)	.023 (.023)	.023 (.023)
Employment-based strategy	-.114 (.015)*	-.114 (.015)*	-.086 (.019)*	-.087 (.019)*
Multidimensional strategy	.035 (.014)*	.035 (.013)*	.021 (.015)	.021 (.015)
Income	-.267 (.024)*	-.266 (.023)*	-.200 (.035)*	-.201 (.035)*
Male-headed Households				
Household head's age	-.036 (.010)*	-.036 (.010)*	-.035 (.014)*	-.035 (.014)*
Household head's education	-.274 (.039)*	-.283 (.038)*	-.272 (.059)*	-.268 (.060)*
Household labor power	-.018 (.010)	-.021 (.010)*	-.031 (.013)*	-.030 (.013)*
Dependency ratio	.077 (.037)*	.073 (.037)	.053 (.059)	.052 (.059)
Non-head adults' education	-.246 (.039)*	-.241 (.038)*	-.242 (.061)*	-.244 (.061)*
Access to resources	.035 (.021)	.032 (.020)	.004 (.021)	.003 (.021)
Asset-oriented strategy	-.031 (.022)	-.029 (.021)	-.008 (.022)	-.007 (.022)
Employment-based strategy	-.094 (.014)*	-.094 (.013)*	-.060 (.016)*	-.060 (.016)*
Multidimensional strategy	.016 (.013)	.017 (.013)	.013 (.014)	.013 (.015)
Income	-.267 (.024)*	-.266 (.023)*	-.200 (.035)*	-.201 (.035)*

* Significant at 0.05 level.

[a] Figures in parentheses are standard errors.

adult members, as well as by the household's total monthly income (see also Table 42). The number of adults employed per household also shows a significant negative effect, suggesting that child care is affected when more of the adults are involved in income-earning.

The results of the estimations for direct and indirect determinants of W/H and H/A do not offer a better understanding on these two measures of anthropometric status (Figures 11 and 12). None of the direct and indirect paths specified to influence W/H and H/A emerged as significant, at path coefficients that are almost zero or zero in Tables 38 and 40. This seems to imply that the significant effects of the household characteristics on monthly income and food expenditure do not ultimately translate – directly or indirectly – into high, low, or normal child W/H and H/A. At the same time, this may stem from measurement errors on the anthropometric data, a methodological issue that is not too farfetched given SALDRU's (1993:278) advice to exercise caution in the use of this data set, particularly that on the children's weight.

Summary of Findings

From the array of findings in the foregoing sections, a number of key points stand out and should be highlighted. These points are summarized below.

1. Rural African households are predominantly headed by males (56 percent). The female and male heads are, on the average, 49 years old, and have attained a mean education of 3.06 years.
2. Approximately 50 percent of the households are organized on an extended basis. The mean size of the household is 5.83; the average labor power units per household is 4.07; and the mean dependency ratio is 1.11. In all these attributes, significant differences characterize female-and male-headed households. The former are more likely to have larger households, larger labor power units, and a higher dependency ratio.
3. More than two-thirds of all the households (71.3 percent) do not have access to land. Male-headed households are less likely to own or to have usufruct on land resources than female-headed households. For the 28.7 percent who have access, the average holding is 2.24 hectares where a mean number of 1.9 crops is grown. Households that

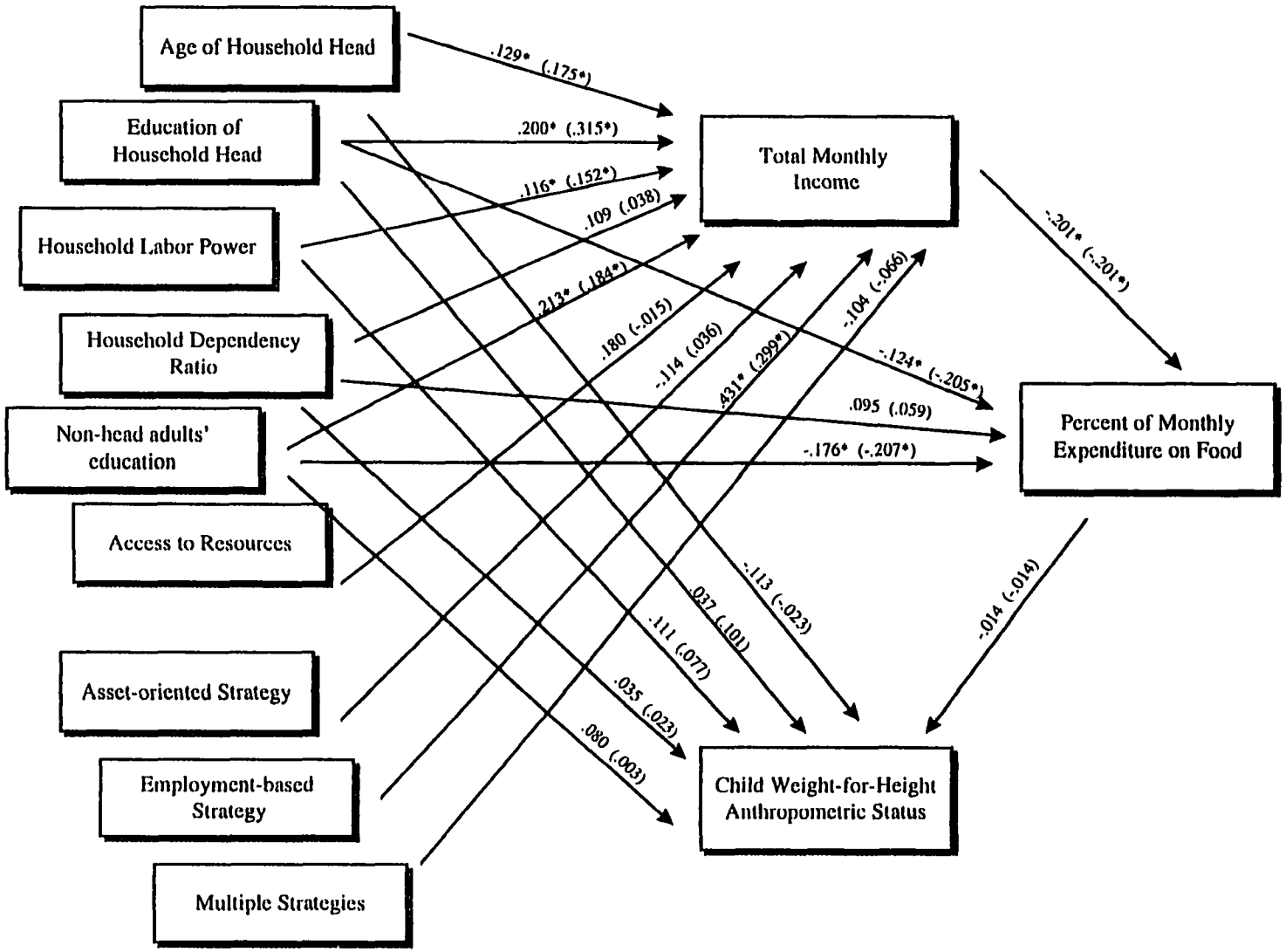

Figure 11. Direct and indirect effects of household characteristics and survival strategies on child weight-for-height anthropometric status.

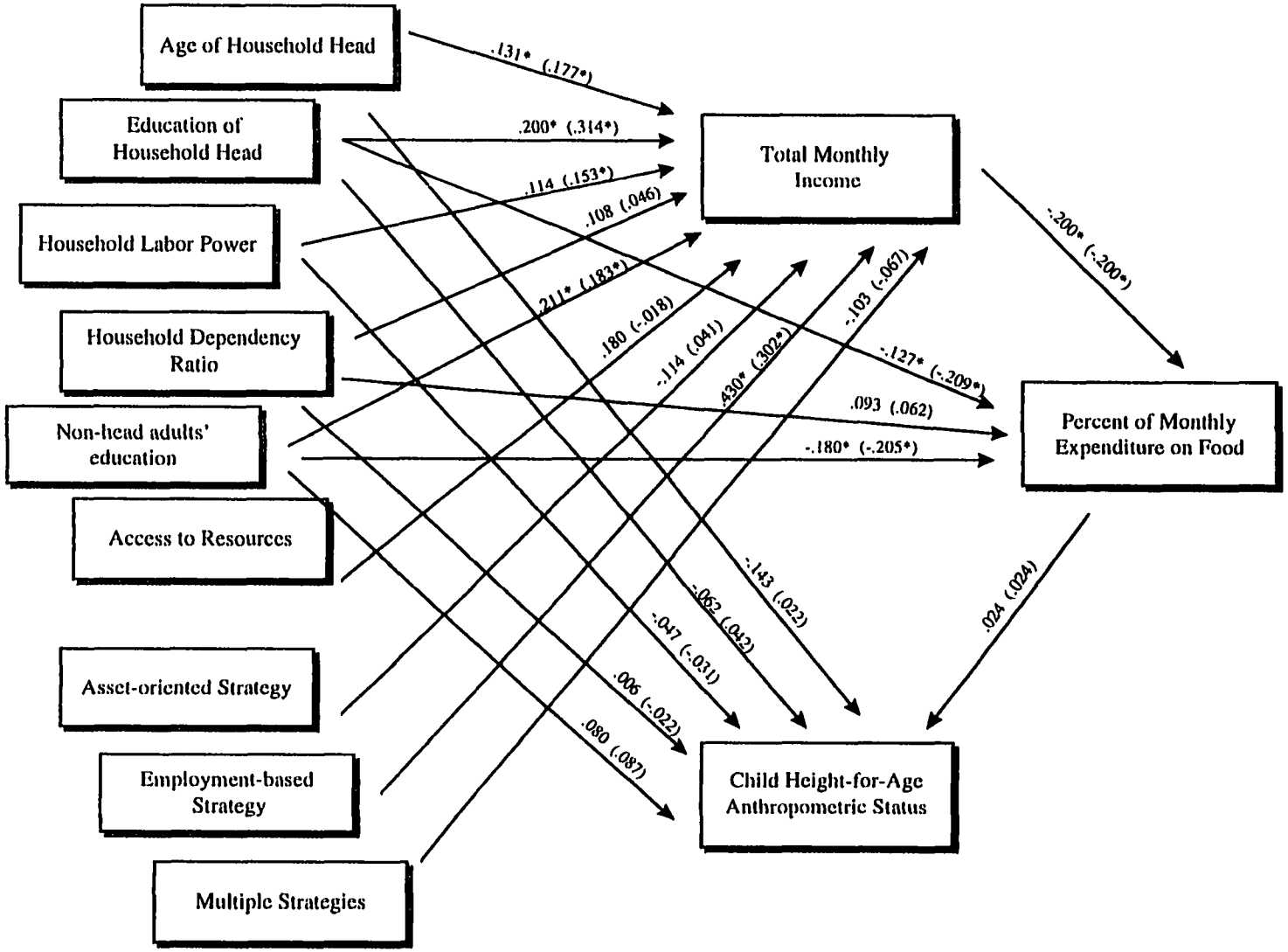

Figure 12. Direct and indirect effects of household characteristics and survival strategies on child height-for-age anthropometric status.

have farm animals (24 percent) have an average cattle equivalent holdings of 5.33 units, while those who have a farm vehicle, equipment, or non-mechanical farm tools own an average of 1.13. Again, significant differences exist among female- and male-headed households. The latter are more likely to have larger land-holdings, to grow more crops, to have more farm animals, and to own one or more farm vehicles, equipment, or a non-mechanical farm implement.

4. Households have one of the four survival strategies defined by the study. About 10.2 percent depend on non-asset and non-employment mechanisms (i.e., income transfers such as pensions and remittances), some 0.4 percent rely on asset-based activities (i.e., agricultural production), 49.1 percent are engaged in employment activities, and 40.3 percent draw on both assets and employment for livelihood.
5. The mean monthly income of all households is R575 from all sources. Households with non-asset and non-employment strategies attained an average of R359; those with asset strategies, R377; units with employment strategy only, R746; and units with both asset and employment mechanisms earned R639. The corresponding monthly income per capita are R111, R122, R220, and R100, respectively.
6. Food spending for all households is, on the average, about 55 percent of the households' total expenditure per month (or, approximately R369). About 60 percent of the expenditures in households with non-asset and non-employment strategies went to food, while in households with employment strategies only, food spending represented 50 percent of their total monthly outlays.
7. Daily intake per adult equivalent of all households averaged at 1914 calories, 66 percent of the recommended energy intake of 2900 kilocalories. Households with asset strategies attained 86 percent of the recommended intake while those with employment strategies averaged about 63 percent. The mean number of food items consumed was 6.75. Households with both asset and employment strategies had a dietary diversity of 7.33 items. Units with both non-asset and non-employment mechanisms had a mean of 6.04 items.

8. Anthropometric status of children at the household levels falls within normal nutritional levels (mean WHZ= -0.03, mean HAZ= -1.48, and mean WAZ= -0.92). Indications of stunting are evident, as about 28.9 percent of the 24-72 month-old children appear to have this condition. Some 7.9 percent are wasted (thin), and about 2.4 percent are wasted and stunted.
9. Results obtained from analysis of variance and path analysis for observed variables in LISREL7 suggest that households with more access to resources are more likely to harness multidimensional survival strategies. However, a multidimensional strategy does not necessarily guarantee higher incomes (γ_{19}= -.131, p=.05 in Table 33 and 35 for model estimations on caloric intake levels and natural logarithm of number of food items), as the causal contribution of a multidimensional strategy is negative rather than positive. Its effects on caloric intake are minimal (β=.006, p=.05 in Table 34) and are significant only for female-headed households. It does not have any significant effects on dietary diversity nor on the W/H and H/A child anthropometric status.
10. Of the survival strategies examined, employment shows up as key to attaining higher levels of income (γ_{18}= .429, p=.05 in Tables 33 and 35). However, its total effects on caloric intake and number of food items or dietary adequacy are negative.
11. The factors that directly and indirectly bear on nutritional well-being can depend on household headship. The specifics of this statement are as follows:
    a. Caloric intake is directly influenced by female- and male-headed households' labor power and percent of monthly expenditure on food. Labor power is more likely to have a negative impact on energy intakes. In male-headed units, the additional factors that directly shape energy intake levels are the head's age and education, and their non-head adults' education. The elements that indirectly bear on caloric intake – across the two household groups – are the head's age and education, dependency ratio, the education of non-head adults, the number of adults employed per household, and income.
    b. Dietary adequacy (or the number of food items consumed), like levels of caloric intake, has for its direct determinants labor power and percent of monthly

allocations for food. Unlike the patterns in the other food consumption measure, however, both of these predictors positively contribute to the number of items consumed in both female- and male-headed households. Male-headed households have the added positive predictors of dependency ratio and their non-head adults' education. Indirectly and significantly affecting dietary adequacy in both households are the household head's age and education, the household's labor power, the education of non-head adult members, the number of adults employed per household, and the household's monthly household income.

c. None of the specified household characteristics and survival strategies appears to directly and/or indirectly influence the children's weight-for-height and height-for-age anthropometric status. Selected characteristics and strategies (e.g., head's age and education, number of adults employed per household, education of non-head adults) significantly bear on income levels attained and percent of monthly expenditure on food.

CHAPTER 5 – CONCLUSIONS AND RECOMMENDATIONS

This study explored the issue of lack of access to food among African households in rural South Africa. Measured in terms of its outcome indicator of nutritional well-being and, more specifically, as food consumption and anthropometric patterns, its analysis entailed examining factors that that have been argued in the literature as critical to its availability and/or varying levels among households. Guiding the analyses were the political economy perspective, particularly Sen's food entitlement approach, and Giddens' structuration theory. The first perspective contends that access to food is a function of differential access to resources and differential capacities to transmute these resources into income and food; the second offers an analytical dimension that views households as units that transform themselves and become transformed by the conditions within and outside them as they fashion or harness mechanisms for their livelihood and survival.

The findings generally provide empirical support for the axiom that levels of nutritional well-being are shaped by the resources over which one has access, and by the opportunities and constraints that shape the transformation of these resources into income and food. For the unique situation of rural African households, gaining sufficient levels of food has implied the mobilization of their few resource options: their income receipts such as pensions and remittances, their land and farm animal assets –where these exist, and their labor power. Comparisons of households employing one or more of these resources for their livelihood attest to their varying food consumption patterns. The few who can produce food from their meager land and farm animal holdings, and who can depend on cash and in-kind remittances, are those who are more likely to have higher levels of caloric intake per adult equivalent and more food items for dietary adequacy. Households that rely solely on employment are less likely to attain the recommended levels despite their higher income. This latter finding is perhaps not too surprising, considering the various studies that have shown the validity of Engels' law: as household income increases, the relative budget allocation for food decreases. Taking the analysis a step further also reveals differential access to food based on gender of the household head. In particular, female-headed units are

more likely to have better caloric consumption and dietary patterns compared to their male-headed counterparts. These variations notwithstanding, a food entitlement failure – i.e., deficiencies in minimum food requirements – is the large picture that besets all the households if their caloric and food item consumption are used as measures of adequate food entitlements.

Unraveling the households' varying levels of access to food also unfolds themes that partially substantiate Giddens' structuration theory. Recalling a key argument of this perspective that there exists a duality and dialectical interplay between human agency (i.e., the household in this instance) and structure (or the norms and resources that the household invokes in the production of action), applications of it have been observed from analyzing the households' resources, or lack of it, in relation to the mechanisms they evolve for livelihood. Seemingly, the likelihood of having an employment strategy at the household level depends on this unit's lack of access to land and/or farm animal holdings, and on the proportion of its adult constituents who are 30-59 year-old males, regardless of these members' educational attainment. This resultant 'social conduct' of reliance on employment strategies, in turn, rests on and contributes to the re-institution of prevailing patriarchal ideologies or 'rules' as households mobilize their male constituents to participate in the labor market or as a majority of these male members seek entry in the labor market to maintain their households.

This condition is not necessarily true for all households, however. This is because the predominant situation, apart from the widespread lack of access to agricultural production resources (and, hence, a survival mechanism based on welfare payments and remittances), is one of unemployment. This particular phenomenon cuts across gender, age, education, and (even) access to resources. [It also appears to be a key factor in the households' food entitlement failure, suggesting that beyond the issues of lack of access to resources, inaccessible food prices, and low wages, an environment of lack of livelihood opportunities is an important contributing element to entitlement shortfalls in minimum food requirements.] Such an environment – said to be rooted in the misallocation of resources in the apartheid economy (UNICEF, 1996:31) – creates a context where households, as a human agency, transform themselves as they build upon tacit 'rules' and lack of employment or

other income-earning resources in the larger community to evolve strategies for survival. That is, as household male and female members turn to labor migration (a livelihood option that this study did not explore due to data limitations), various household forms[18] that re-create prevailing social relations based on gender, age, education, and kinship are engendered and are subsequently reproduced in time and across spaces. It is in this manner that households as a social unit and as a unit of analysis have taken a different shape, an empirical condition that is implicit in Giddens' theoretical formulation. Indications of this changing shape of the household as a unit may be inferred in this study from the situation of rural African households that have both asset and employment strategies (at an average unit size of 7.36, a mean of 1.83 children up 72 months old, the second highest monthly median remittance of R167, and with about 49 percent of them having female heads). For the most part, however, the pattern finds substantial support in anthropological investigations on the issue.

Overall, the findings of the study lend support to the hypothesis that rural African households' nutritional well-being is determined by the direct and indirect effects of, and potential interactions among, households' structure and characteristics, access-to-resource attributes, survival strategies, as well as income and expenditure patterns. The key direct influences of all households' food consumption from among the household characteristics are the head's education and the household's labor power. Male-headed households' energy intake and dietary diversity are shaped by additional factors such as the head's age, their non-head adults' education, access to resources, and dependency ratio. Of the survival strategies, employment is a significant indirect predictor of food consumption. Its effects are negative, however, and point to an average decrease of 37 and 28 calories per adult equivalent per day for every additional adult who engages in employment in female- and male-headed households, respectively. Having a multi-dimensional strategy contributes as well to food

[18] Some of the forms that rural African households have taken include 'relict' rural households dependent on remittances and welfare payments, households among whom children of migrant laborers are 'dispersed' for fostering , and households that assume both of these forms (Spiegel et al., 1995:3; Spiegel et al., 1994:10-11). Siqwana-Ndulo (1993:143-149) also offers various typologies of households based on her study of rural African family structure in the Transkei, South Africa.

consumption (specifically to energy intake) but this holds only for female-headed units. Asset strategies do not significantly influence caloric intake nor dietary diversity whether directly or indirectly; this finding is not altogether unexpected considering the meager resources over which only a few households can access. Household income mediates food consumption in a negative direction such that an average reduction of 85 and 78 calories per adult equivalent per day occurs for every Rand increase in income in female- and male-headed units, respectively. Monthly allocations for food – ranging from 50 to 60 percent of total expenditures – is a positive significant predictor of caloric intake and dietary diversity.

Interaction effects were also discerned from data analysis. Having to do more with income generation than with levels of food consumption, these effects support the descriptive findings that differences based on gender of household head exist in terms of access to resources and in terms of harnessing these resources as a strategy for attaining a level of income. The specific pattern that these effects portray is that while fewer of the male-headed households have access to production resources, those who do are more likely to generate income from these assets. Conversely, while more of the female-headed units have access to resources, the impact of harnessing these resources as a survival strategy is more likely to be negative than positive.

Determining the predictors of the weight-for-height and height-for-age anthropometric parameters has been less successful. As noted earlier, the findings may be due to measurement errors in the anthropometric data specifically that on the children's weight.

Beyond these observed interrelations between the household characteristics, survival strategies, and measures of nutritional well-being, the findings point to the prevalence of low nutritional levels among rural African households. Caloric intake per adult equivalent is low (1914 calories or 66 percent of the recommended energy intake of 2900 kcal, the reference person being a male adult). In terms of the number of food items as a measure of dietary adequacy, deficient consumption patterns appear to also be the rule rather than the exception, with households showing an average of 7 items, a level that is only 45 percent of the recommended 15 items. And, while more than half of the children show W/H, H/A, and

W/A anthropometric status that seemingly fall within normal nutritional levels, there are indications of very high prevalence of stunting and underweight problems especially at the individual level. Bearing in mind that the results of the anthropometric analysis should be viewed with caution, the total picture is seemingly one of chronic food insecurity, a situation that is borne by the problem of stunting if it is indeed an indication of the actual height-for-age child anthropometric status in rural African households. It will be recalled that a retarded linear growth is an indicator of nutritional inadequacy over a period of years and has been said to be a measure of socioeconomic deprivation. This food insecurity situation is perhaps not unexpected, considering that about 70 percent of the households do not have access to production resources, around 24 percent of them have adult members who were said to be unemployed (or, based on the individual level analysis, about 60.6 percent of all resident adults), and some 10 percent of all those with one or more strategies for survival are largely dependent on monthly remittances and old age pensions. While all these suggest the strong likelihood of low purchasing power, a monthly median income per capita of R117 (US$33) underscores the inability of rural African households to gain access to adequate food. In all, the picture is one of poverty which is an established precondition of household food insecurity.

Based on these results of the study, two major policy implications may be drawn. Foremost of these relates to the critical need to address the lack of productive resources among the majority of rural African households. As the study points out, households that have access to these resources are more likely to draw upon these assets for food and, to an extent, for income. At the same time, households that depend solely on these assets for their livelihood, albeit constituting a minority of 12, are able to attain 86 percent of the recommended threshold for adequate energy consumption. Recent developments in the country show a national effort to respond to this problem through land reform (National Land Committee, August 1996:1-19; April 1996:1-19; March 1996:1-19). This initiative is a positive step and, while the intricacies of its implementation are beyond what this study has to offer, a key issue that finds support in this research is that of placing women and men on equal footing in terms of access to land and to infrastructure support. As earlier noted,

female-headed households, in comparison to their male-headed counterparts, are more likely to have meager resources and to generate low income when they harness these resources for their livelihood. The recommendation, in effect, is to incorporate gender-based concerns as one of the cornerstones of the country's land reform program.

The second issue that this study surfaces, and one that also bears on policy formulation, is that of unemployment. As was earlier discussed, the phenomenon obtains among a not inconsiderable number of households (24 percent) and individuals (61 percent), and suggests the existence of a reserve pool of labor that does not have access to income-earning activities or has been constrained by an environment that limits their participation in the labor market. Employment generation seems to be the most appropriate solution, albeit the study found this strategy to have an indirect negative effect on food consumption. Creating employment opportunities in the agricultural sector – a program that is necessarily tied to land redistribution – may provide a more positive contribution, however, as it can enable households to draw upon their produce for subsistence.

Current restructuring efforts show a focus on employment creation in the rural areas of the country (National Land Committee, August 1996:18-19). Beyond a rhetoric on the mechanics of its implementation, the task frequently presupposes the availability of resources, skills and some level of education that a majority of the rural African households do not have. Levels of education among household heads, averaging 3.06 years, are lower among female heads (2.81 years) than male heads. Non-head adults, on the other hand, average 4.87 years. Some form of skills training appears to be virtually non-existent and, as repeatedly noted, more than two-thirds of the households do not have the agricultural resources that will provide for their food needs and that will serve as the basis of small-scale agricultural enterprise. Attention will have to be paid to these considerations if there is to be a sound solution to rural African households' unemployment and overall marginal situation. In more general terms, rural employment generation will have to be viewed in the context of an integrated program of agricultural resource distribution as enhanced by active initiatives to improve levels of formal and non-formal education.

Finally, the above suggestions are not meant to place the onus solely on policy-makers. Efforts to also involve the rural African households should be made as answers are sought to address these households' socioeconomic deprivation. It is only in so doing that they can move beyond merely evolving strategies for food and for survival, exercise their capacities for self-determination and, ultimately, regain control over their lives.

In closing this study, its limitations and corresponding suggestions for future investigations should be noted. These are briefly outlined below.

1. This research has been based on a national survey aimed at establishing baseline statistics concerning South African households. Towards this end, the data collected focused solely on food availability at the household level in terms of aggregated amounts (i.e., quantities and values) on some 28 food items consumed either on a weekly or monthly basis. Thus, while the findings provide indications on the food (in)security situation among these units, the depth with which the research could have evaluated the issue has been circumscribed by the existing data. Some areas that might be pursued in future studies regarding South African households' access to food are the intra-household dynamics of food sharing (or the inter- and intra-member variations in food consumption) and the locus of control on resource allocation for food. An additional issue that should be explored is the local population's conception of what constitutes the broad category of "food" since females and males are likely to have varying definitions of this basic good. These concerns are critical if a full grasp of the food situation among the households is to be reached.
2. As implied above, obtaining the households' food consumption patterns utilized the list-recall method[19]. Considering the amount of detail sought in this regard (in addition to those obtained for other concerns such as agricultural production and individual level employment), measurement errors arising from respondents' memory lapses and social

[19] The list-recall method entails requesting the respondent, with the aid of a list of major food items likely to be consumed by the household, to recall all foods used by the unit (based on purchase, home production, or food gifts) and their quantity, price, or imputed values, over a specified period of time – usually the preceding one to seven days (Gibson, 1990:27).

desirability response bias are possibilities that should not be ruled out. These may have resulted in an under- or over-estimation of actual number and sources of food items consumed, as well as of actual kilogram amounts that were bought or eaten. Thus, the predominantly low levels in dietary adequacy and energy intake could reflect under-reporting in food usage due to recall problems. At the same time, these low levels may mirror some degree of over-reporting inasmuch as underweight persons – who may not be uncommon in rural Africa households given their poverty levels – have been found to over-estimate their energy intakes (Gibson, 1990:86-87). The fairly positive trend on utilization of plant-based food items, on the other hand, could be due to an over-reporting on consumption of 'good' foods such as fruits and vegetables. In future food intake studies, an approach worth exploring might be a record-keeping procedure or what have been referred to by Gibson (1990:39-40) as estimated food records. While tedious, subject to the preconditions of writing and reading skills, and is not error-free, this method could provide the closest estimates to actual amounts of food eaten, bought, or received as gifts.

3. The use of number of food items as a measure of dietary adequacy is a procedure that may be context- or situation-specific. For most disadvantaged population groups, variety in food items is less of a concern than having something to eat and, needless to say, is a luxury that they can ill afford. While it may be argued that most of the food items might be home-produced, related concerns such as access to land (even for home gardening purposes only), water, and plant seeds can inhibit the seeming practicality of the solution. The measure might be improved by exploring its applicability in developing country contexts, particularly among the poor. More specifically, a lower ceiling that equally meets the poor's minimum dietary requirements (as based necessarily on a nutrient analysis of this group's most consumed items) might be explored.

It should also be remembered that the recommended 15-food-item measure is one that has been conventionally employed at the individual level. It is likely that at a group level of analysis, the ceiling might actually be higher especially if the assumption of resource pooling and sharing is brought into play.

4. As noted in previous discussions, the findings on child anthropometric status, particularly those relating to child's weight, are ones on which caution should be observed. Under- and over-reporting of children's weight may have occurred such that the resulting pattern, on the one hand, is a high prevalence of the underweight problem. Over-reporting of the children's weight, on the other hand, may account for the seeming picture of normal nutritional levels among a majority of the children, given that weight is a composite factor of the weight-for height anthropometric index.

   The caveat is not to suggest that the findings be taken less seriously. The indications of very high prevalences of stunting and underweight problems especially at the individual level should generate enough concern to focus greater efforts on: (a) creating a food secure environment to minimize, in the long term, the incidence of retarded linear growth, and (b) undertaking a re-measurement of the children's weight in order to formulate appropriate health and/or nutritional interventions, if necessary. It will be useful to remember that the more deviant is the anthropometric measure for an individual, the greater is the likelihood that significant risks of morbidity, cognitive or functional impairment, and mortality are present (Beaton et al., 1990:7).

5. Operationalizing the key concept of survival strategies was a task that had to build on the limited sets of information that would work in terms of its analysis. It is for this reason that the concept's related variables (e.g., asset strategies, employment) were frequently measured on an ordinal level and, as such, tended to have restricted ranges. This issue of restricted ranges is being raised since "it can underestimate the true strength of association between variables and can diminish the accuracy of regression equations" (Grimm, 1993:382-384). It gains particular salience since, in general, estimating path coefficients draws upon correlation coefficients (rho or ρ for population parameters or Pearson's r for sample statistics) that, in this investigation, are predominantly low ($<.10$). This suggests that the actual relationship between the specified factors – including the magnitude of the independent variables' contribution to the dependent ones – may have been undermined by said restricted ranges of several variables such that the resulting coefficients are smaller and tend to be less significant than they might actually be. It may

be useful to keep this statistical issue in mind as one reviews the magnitude of the correlation and path coefficients that had been derived in the study. Future studies on survival strategies ought to consider the alternative mechanisms that households employ (e.g., food and/or labor exchanges, food rationing) to meet their food needs. Labor migration (and its concomitant phenomenon of remittance-dependence by relict households) is a critical issue that also requires attention as it has been a central strategy for survival among many rural African households. A qualitative-quantitative approach may best capture the underlying processes of survival strategies and could generate a better understanding of this emerging trend among various population groups in Africa (Bangura, 1994:791-792) as well as in other developing countries.

6. Finally, a note on the relevance of this study to a post-apartheid South Africa. The data analyzed for this study were gathered towards the last quarter of 1993, about six months before the formal transition of the country into a nation also of, by, and for Africans and other non-white populations. Initiatives to respond to the concerns that this study raises have since been taken. These efforts notwithstanding, the findings of this study offer constant reminders – to South Africa and to other developing countries – of some of the ground-level key issues in planning and implementing meaningful reforms towards societal transformation.

APPENDIX A
SUMMARY OF HYPOTHESES AND RESULTS OF ANALYSES

A1. Summary of Hypotheses

Variables [1]	X and Y Relationship [2]			
	Caloric intake	Dietary diversity	Weight-for-height	Height-for-age
Dependent Variables				
Household food consumption patterns (caloric intake, dietary diversity) [I]				
Child anthropometric measures (W/H, H/A, W/A) [3] [I]				
Independent Variables				
Household Structure and Characteristics				
Gender of household head [O] [4]	+	+	+	+
Age of household head [I]	+	+	+	+
Education of household head [I]	+	+	+	+
Household labor power [I]	+	+	+	+
Dependency ratio [I]	–	–	–	–
Adult members' educational levels [I]	+	+	+	+
Access to resources [I]	+	+	+	+
Survival Strategies				
Asset-oriented [I]	+	+	+	+
Employment-based [O]	–	–	–	–
Multidimensional [O]	+	+	+	+
Intervening Variables				
Monthly household income [I]	–	–	–	–
Percent of monthly expenditure on food [I]	+	+	+	+

[1] [ ] indicates variables' level of measurement: I = interval; O = ordinal; N = nominal.
[2] Plus (+) and minus (–) signs indicate positive and negative relationships, respectively.
[3] Abbreviations denote the anthropometric indices of weight-for-height (W/H), height-for-age (H/A), and weight-for-age (W/A).
[4] Gender of household head has been coded as: 0 = female-headed and 1 = male-headed.

A2. Results of Analyses

Variables [1]	X and Y Relationship [2,3]							
	Caloric intake		Dietary diversity		Weight-for-height		Height-for-age	
	F	M	F	M	F	M	F	M
Dependent Variables								
Household food consumption patterns (caloric intake, dietary diversity) [I]								
Child anthropometric measures (W/H, H/A, W/A) [3] [I]								
Independent Variables								
Household Structure and Characteristics								
Age of household head [I]	(+)	+	(+)	(+)	(–)	(–)	(–)	(+)
Education of household head [I]	(+)	+	+	+	(+)	(+)	(–)	(+)
Household labor power [I]	–	–	+	+	(+)	(+)	(–)	(–)
Dependency ratio [I]	(–)	(+)	(+)	+	(+)	(+)	(+)	(–)
Adult members' educational levels [I]	(–)	+	(+)	+	(+)	(+)	(+)	(+)
Access to resources [I]	(–)	+	(–)	(+)	(+)	(+)	(–)	(+)
Survival Strategies								
Asset-oriented [I]	(+)	(–)	(+)	(–)	(+)	(+)	(+)	(+)
Employment-based [O]	–	–	–	–	(+)	(+)	(–)	(–)
Multidimensional [O]	+	(+)	+	+	(+)	(+)	(+)	(+)
Intervening Variables								
Monthly household income [I]	–	–	–	–	(+)	(+)	(–)	(–)
Percent of monthly expenditure on food [I]	+	+	+	+	(–)	(–)	(+)	(+)

[1] [ ] indicates variables' level of measurement: I = interval; O = ordinal; N = nominal.

[2] Plus (+) and minus (–) signs indicate positive and negative relationships, respectively, and depict total effects of independent variables on dependent ones. Parenthesized ( ) signs are findings that are not statistically significant and where some relationships were opposite to the predicted direction.

[3] Abbreviations denote: F = female-headed households, M = male-headed households, W/H = weight-for-height, H/A = height-for-age, and W/A = weight-for-age.

APPENDIX B
COMPOSITE VARIABLES AND SCALED INDICATORS[1]

Access to Resources (HHRSRCE2)

- Levels of access to land
  0 = None/no access to land
  1 = Communal access to crop and graze land
  2 = Combinations of no access to crop/graze land with access to graze/crop land or communal-rented, communal-owned crop and graze land
  3 = Combinations of owned crop/graze land, rented crop/graze land, owned-rented crop/graze land

- Size of landholding
  0 = None/no access to land
  1 = Less than or equal to 1.00 hectares
  2 = 1.01 to 4.00 hectares
  3 = ≥ 4.01 hectares

- Number of crops grown
  0 = None/no access to land
  1 = One crop only
  2 = Two to four crops
  3 = Five to eight crops

- Livestock holdings (cattle equivalent units)
  0 = None/no access to farm animals
  1 = 0.01 to 2.99 units
  2 = 3.00 to 5.99 units
  3 = ≥ 6.00 units

- Farm animal diversity
  0 = None/no access to farm animals
  1 = Has one type of farm animal
  2 = Has two to three types
  3 = Has four to five types

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[1] Items in each scaled variable (i.e., HHRSRCE2 and STRTGY1) are weighted equally. That is, each of the six items in the scaled access-to-resources attribute (4 items in the case of asset-oriented strategies) is viewed as contributing equally to the total picture of a household's access to resources (or the degree to which a household builds on its assets for food and income) and, hence, to the derived summated score for each household. This approach has been taken based on Nunnally's (1978:606) argument for parsimonious treatment of a scale's component items.

- Index of farm asset ownership
  0 = None/no farm assets owned
  1 = Owns mechanical tools only
  2 = Owns mechanical equipment and non-mechanical tools
  3 = Owns vehicle with mechanical equipment and/or non-mechanical tools

Asset-oriented Strategy (STRTGY1)

- Type of land use
  0 = None/no access to land
  1 = Does not use land
  2 = Used part of crop/graze land; used half for crop-half for grazing; or used land for grazing purposes
  3 = Used all or most for crops

- Extent of land use
  0 = None/no access to land
  1 = None used in 1993
  2 = Used less than to about half of land area
  3 = Used all or more than half

- Farm diversity/diversity of farm enterprises
  0 = None/no crops or livestock
  1 = Engaged in crop production only
  2 = Engaged in animal production only
  3 = Engaged in both crop and animal production

- Number of agricultural products sold
  0 = None/no access to crop or animal production
  1 = None sold
  2 = Sold one to three plant and animal products
  3 = Sold four to eight plant and animal products

APPENDIX C
CASE STUDIES IN HOUSEHOLD SURVIVAL STRATEGIES [1]

Case 1. A household with non-asset and non-employment livelihood mechanism (HH1)

Household (HH1) is a unit that is located in the Eastern Cape Province. Made up of eight members, it has four adults, and four young dependents ranging from 2-13 years. The head of the unit is a 65-year-old-male who is a pensioner (retired) and who did not have an opportunity to attend a formal educational institution. Neither his 61-year-old spouse nor his 37-year-old daughter had a chance to obtain a formal education. The other members of the household are all grandchildren, three of whom – at ages, 18, 13, and 8 – completed only a year of formal schooling while the 4- and 2-year-old members are too young to be in any formal educational institution.

The household does not have access to land nor have any farm animals. Of an effective 4.50 labor power units, none are actively engaged in income-earning activities. The head's spouse takes the responsibility of child rearing, the daughter has been unfit for employment due to an illness, while the oldest grandson is not seeking work because "none is available." Consequently, HH1 relies solely on the head's old age pension which, in 1993, averaged R395 monthly.

Against a livelihood mechanism that generates a household income that is 45 percent below the median for all rural African households, energy intake of the unit is low at 1928 calories per adult equivalent per day. This amount is 18 percent below the maintenance requirement of 80 percent of the recommended caloric intake. The number of food items consumed in the past week by the household was 9 items and was higher than the average 6.75 for all rural African households. Of these items, 78 percent were plant-based foods, suggesting that with food spending constituting 76 percent of its total expenditures, the unit's purchasing power limits their choice to foods that provide dietary adequacy. Of the two 24-

[1] The households representing each of the survival strategies have been selected purposively. The criteria of selection included: (a) availability of data on all four of the endogenous variables, and (b) proximity of households' energy intake to the overall mean of 1914 calories per adult equivalent per day.

72-month-old children in the household, the child included in the sample for anthropometric analysis showed an approximately normal nutritional status in terms of the weight-for-age and weight-for-height indices. This same child, however, appears to have a stunting problem (at -3.33 SD below the median of the reference population). This seems to suggest that while the child seems currently well-nourished, he has experienced a lack of access to food over a long period of time which has resulted in his retarded linear growth. [It is worth recalling, however, that the Southern Africa Labour and Development Research Unit (SALDRU) advises caution in the use of the weight data. The weight-for-height and weight-for-age parameters, thus, may not reflect the child's actual nutritional status *vis-a-vis* these indices.]

Case 2. A household with asset strategy only (HH2)

HH2, in Northern Province (former Northern Transvaal), is an eight-member unit with a *de jure* female head. A fairly young household, its head is a 26-year-old who completed 7 years of formal education. The two other adults, aged 20 and 18 years, are the head's relations by marriage (i.e., a sister- and brother-in-law) and have the same level of education as the household head. The ages of the five 'minors' in the household range from 3-14 years, one of whom has had 2 years of formal schooling while the two others completed only the Standard 1 level.

The unit has access to land but this access is on a communal basis. While information is not available on the amount of land being cultivated, the household grows four types of crops –namely, maize grain, dry beans, and two varieties of green vegetables – with the produce being home consumed since none of it was sold. The household does not have any farm animals, nor agricultural implements such as a vehicle, a mechanized equipment, or a non-mechanical tool. None of the three adults is engaged in any form of employment due to the child-rearing and home-making responsibilities of the two women, and because the third adult, a male, attends a formal educational institution. Subsistence production for the household is not attended to by these adults on a full-time basis and may actually be delegated to older minor members (i.e., the 12- and 14-year olds) of the unit. Apart from the foods obtained from subsistence agriculture, the household depends on monthly remittances

from the non-resident spouse of the *de jure* female head. This monthly receipt makes up 96 percent of the unit's total monthly income, the remaining proportion being the imputed earnings from its crop production. Overall, total monthly income of HH2 is 36 percent below the median income of rural African households and indicates its relative poverty compared to HH1.

While the household ranks among the economically poorest rural African units at a monthly per capita income of R46, it is able to attain for its members the maintenance requirement, its consumption being 2330 calories per adult equivalent per day. It also attains a higher level of dietary adequacy (compared to the average obtained by rural African households), having consumed 10 food items in the past week – of which 60 percent were derived from plant sources. Seemingly, the unit's subsistence production contributes to these food consumption patterns and reduces, to a degree, the unit's food spending which stands high at 65 percent of total expenditures. On the other hand, it may also be that female headship of the unit positively influences food consumption, an argument that finds support in a number of studies. Turning to the anthropometric status of the sampled child in the household, a similar pattern as that in HH1 may be observed. That is, the child's weight-related measures do not indicate undernutrition problems but the height-for-age index does, the latter parameter falling 2SD below the median of the reference population. This seems to suggest that while the household shows adequate food consumption patterns at the present time, it went through an extended period of inadequate access to food that has manifested in the child's short stature.

Case 3. A household with an employment strategy only (HH3)

Household 3 (HH3), also in the Northern Province, is a four-member, male-headed unit. The head is 27 years old and has a spouse who is six years younger. Compared to those in an average rural African household, both are fairly well educated, having completed Standard 10 and Standard 8, respectively. These two are the only adults in the household, as the other two members are the couple's one- and three-year-old sons.

As with most rural African units, the household does not have access to agricultural or home-based enterprise-related resources. It bases its livelihood, as such, solely on the head's regular wage employment, with the spouse being involved in child-rearing and home-making activities. With a total monthly income of R450 and a monthly per capita income of R112, HH3 falls among the poorest 60 percent of all rural African households despite an overall finding that units with an employment strategy are more likely to be well-off.

With an income that rests on wages only, the household allocates as much as 64 percent of its total expenditures on food. Such spending does not translate into adequate food consumption, however, since its daily caloric intake per adult equivalent falls 18 percent short of the maintenance requirement. This food inadequacy also is revealed in the number of food items consumed in the past week at only one third of the suggested 15 items for dietary adequacy. The relative deprivation of the household – in terms of income and food – is reflected as well in the sample child's anthropometric status since said child depicts wasting and underweight problems (at W/H = -2.04SD and W/A = -2.66SD).

Overall, HH3's employment strategy does not appear to contribute to the members' nutritional well-being. It would seem that, even as the male head has gained entry into regular wage employment, the earnings from this formal sector of the labor market are still not enough to ensure the unit's adequate food consumption and child nutrition.

Case 4. A household with asset and employment strategies (HH4)

Household 4 (HH4) is an eight-member unit also located in the Eastern Cape. It has a 58-year-old *de jure* female head whose formal educational level falls near the average, at 4 years of schooling. The unit has two other adult members: a non-resident 29-year old daughter and a resident 16-year-old son, both of whom have relatively high educational levels at 5 and 10 years, respectively. The five other members of the unit are young dependents, four of whom are the head's grandchildren. At ages ranging from 4-14 years, four of these children completed 1-5 years of formal education.

The household's access to resources consists mainly of usufruct to grazing and cropping land. The total land area that it uses is 3 hectares; its farm animal holdings consist

of one head of cattle and one pig. In 1993, the household did not use the cropland to which it has access. It engaged in livestock production; however, no livestock products were sold. Apart from this activity, the only other source of household earnings is the monthly remittance of R67 that comes from the head's absent spouse. The head herself is involved in livestock raising activities as well as in child-rearing and home-making tasks, while the 16-year old son is not engaged in income earning because "none is available." There was no activity reported for the head's 29-year-old non-resident daughter. Overall, the monthly household income is R73, a portion of which is made up of the household's imputed earnings of R6 from its livestock production.

Against a livelihood strategy that provides the household with meager income, energy intake is low at 1919 calories per adult equivalent per day even as food spending is high at 64 percent of the total expenditure. As with the average rural African household, the amount is 18 percent below the maintenance requirement. The unit appears to also have the same number of food items as the average rural African unit, at 7 items in the past week with about 71 percent of these items being derived from plant sources. Despite these apparent deficiencies in food consumption, however, the sample 4-year-old child does not seem to have undernutrition problems, as the z-scores fall within normal nutritional levels (WHZ= .60, HAZ= .08, and WAZ= .39). Seemingly, the child is favored in terms of food allocations such that its net effects reflect in the child's adequate nutritional status.

The above four case studies illustrate the complex interplay of conditions that help shape households' survival strategies and how these indirectly affect the members' nutritional well-being. From these four cases, it is clear that a lack of access to resources and employment opportunities, including low wages, can constrain the mechanisms that can be evolved for livelihood and survival, and can hinder the attainment of adequate food consumption patterns.

APPENDIX D
COMPARISONS OF MEAN Z-SCORES ON ANTHROPOMETRIC INDICES

Anthropometric Indices	n[1]	Mean Difference	t	Sig. (two-tailed)
EpiInfo-SALDRU Index Comparisons (paired samples t-test) [2]				
WHZ - WHZ1	2627	.002	.571	.281
HAZ - HAZ1	2602	-.003	-1.079	.568
WAZ - WAZ1	2628	-.001	-1.111	.266
Index Comparisons among 24-72-Month-Old African Children				
Weight-for-Height (W/H)				
Rural-urban	1642 (290)	.2570	2.427	.015
Rural-metro	1642 (183)	.1291	.973	.331
Rural-combined urban and metro	1642 (473)	.2075	2.377	.018
Height-for-Age				
Rural-urban	1654 (294)	-.4270	-3.553	.000
Rural-metro	1654 (184)	-.7125	-4.801	.000
Rural-combined urban and metro	1654 (478)	-.5369	-5.450	.000
Weight-for-Age				
Rural-urban	1655 (294)	-.0329	-.358	.720
Rural-metro	1655 (184)	-.2717	-2.354	.019
Rural-combined urban and metro	1655 (478)	-.1248	-1.638	.102

[1] Numbers in parentheses are n's of the other group against which rural children's indices are compared.

[2] WHZ, HAZ, and WAZ are the EpiInfo-calculated indices; WHZ1, HAZ1, and WAZ1 are the SALDRU-derived measures.

APPEI

BIVARIATE CORRELATIONS BETWEEN INDEPENDENT AND I

E1. Female-headed Units

Variables	1	2	3	4	5	6	7
1. AEQCALI	1.00						
2. LNFDITMS	.40**	1.00					
3. WHZ	-.07	.08	1.00				
4. HAZ	.13**	.09*	-.23**	1.00			
5. TOTMINCI	-.03	.17**	.06	.03	1.00		
6. PMXFD	.20**	.06*	-.05	.03	-.27**	1.00	
7. AGE	-.04	.02	-.01	-.10*	.13**	.06*	1.00
8. HHDSEDUC	-.01	.14**	.05	.10*	.20**	-.23**	-.43**
9. LBRPWR	-.34**	.10**	.04	-.03	.25**	-.02	.22**
10. DEPRATIO	.06*	-.02	-.02	-.03	-.07**	.13**	.06**
11. MNEDUC	-.02	.09**	.04	.10*	.26**	-.26**	-.04
12. HHRSRSCE2	-.02	.14**	.08	-.04	.07**	.04	.14**
13. STRTGYI	.01	.12**	.09*	-.04	.07**	.03	.15**
14. NEMPLYD	-.17**	.08*	.01	.00	.42**	-.11**	.06*
15. MLTSTRTG	-.08**	.09**	.05	-.03	.14**	-.02	.09**

* Correlation is significant at the .05 level (two-tailed).

** Correlation is significant at the.01 level (two-tailed).

APPENDIX E

:NDENT AND DEPENDENT VARIABLES BY GENDER OF HOUSEHOLD HEAD

	7	8	9	10	11	12	13	14	16
)0									
)6*	1.00								
:3**	-.43**	1.00							
)2	.22**	-.07**	1.00						
.3**	.06**	-.09**	-.24**	1.00					
:6**	-.04	.33**	.07**	-.21**	1.00				
)4	.14**	-.05*	.31**	-.02	-.05	1.00			
)3	.15**	-.06*	.27**	-.01	-.04	.91**	1.00		
11**	.06*	.00	.42**	-.18**	.06*	.24**	.26**	1.00	
)2	.09**	-.04	.35**	-.14**	.00	.59**	.65**	.59**	1.00

E2. Male-headed Units

Variables	1	2	3	4	5	6	7	8
1. AEQCALI	1.00							
2. LNFDITMS	.46**	1.00						
3. WHZ	.02	.10*	1.00					
4. HAZ	.00	.06	-.30**	1.00				
5. TOTMINCI	.04	.24**	.05	.07	1.00			
6. PMXFD	.07**	.03	.00	-.08*	-.32**	1.00		
7. AGE	-.06*	.12**	-.02	-.01	.07**	.14**	1.00	
8. HHDSEDUC	.11**	.12**	.11**	.06	.35**	-.32**	-.37**	1.00
9. LBRPWR	-.23**	.23**	.05	-.02	.19**	.16**	.48**	-.15*
10. DEPRATIO	.06*	.02	-.01	-.02	-.09**	.14**	.13**	-.07*
11. MNEDUC	.05	.20**	.07	.09*	.39**	-.37**	-.01	.49*
12. HHRSRSCE2	.03	.20**	.13**	-.09*	.05*	.09**	.34**	-.11*
13. STRTGYI	.03	.19**	.06	-.04	.06**	.08**	.32**	-.09*
14. NEMPLYD	-.09**	.14**	-.01	.10*	.39**	-.01	.08**	.03
15. MLTSTRTG	.01	.17**	.07	-.03	.15**	.01	.17**	-.03

* Correlation is significant at the .05 level (two-tailed).

** Correlation is significant at the.01 level (two-tailed).

6	7	8	9	10	11	12	13	14	16
.00									
.14**	1.00								
.32**	-.37**	1.00							
.16**	.48**	-.15**	1.00						
.14**	.13**	-.07**	-.17**	1.00					
.37**	-.01	.49**	.19**	-.15**	1.00				
.09**	.34**	-.11**	.42**	.08**	.05*	1.00			
.08**	.32**	-.09**	.41**	.06*	.05*	.93**	1.00		
.01	.08**	.03	.34**	-.18**	.12**	.12**	.16**	1.00	
.01	.17**	-.03	.33**	-.03	.10**	.59**	.64**	.45**	1.00

REFERENCES CITED

Adams, Alayne, 1993. "Food Security in Mali: Exploring the Role of the Moral Economy." *IDS Bulletin.* 24(4):41-51.

Ashworth, Ann, and E. Dowler. 1991. "Child Malnutrition." Pp. 122-133 in *Disease Mortality in Sub-Saharan Africa,* edited by R. Feachem and D.T. Jamison. New York: Oxford University Press for the World Bank.

Athanasios, A., M. Bazuneh, and B.J. Deaton. 1994. "Impacts of FFW on Nutrition in Rural Kenya." *Agricultural Economics.* 11(2-3):301-309.

Babakus, Emin, C.E. Ferguson, Jr., and K.G. Jöreskog. 1987. "The Sensitivity of Confirmatory Maximum Likelihood Factor Analysis to Violations of Measurement Scale and Distributional Assumptions" *Journal of Marketing Research.* 24:222-228.

Bangura, Yusuf. 1994. "Economic Restructuring, Coping Strategies and Social Change: Implications for Institutional Development in Africa." *Development and Change.* 25:785-827.

Beaton, G., A. Kelly, J. Kevany, R. Martorell, and J. Mason. 1990. *Appropriate Uses of Anthropometric Indices in Children.* ACC/SCN State-of-the-Art Series: Nutrition Policy Discussion Paper No.7. Geneva: United Nations Administrative Committee on Coordination/SubCommittee on Nutrition.

Bernstein, Henry. 1992. "Agrarian Structures and Change: Sub-Saharan Africa." Pp. 65-82 in *Rural Livelihoods: Crises and Responses,* edited by H. Bernstein, B. Crow, and H. Johnson. Oxford: Oxford University Press and The Open University.

Bernstein, Richard J. 1989. "Social Theory as Critique." Pp. 19-33 in *Social Theory of Modern Societies: Anthony Giddens and His Critics,* edited by D. Held and J.B. Thompson. Cambridge: Cambridge University Press.

Bigsten, Arne, and S. Kayizzi-Mugerwa. 1995. "Rural Sector Responses to Economic Crisis in Uganda." *Journal of International Development.* 7(2):181-209.

Bouis, Howarth. 1994. "Consumption Effects of Commercialization of Agriculture." Pp. 65-78 in *Agricultural Commercialization, Economic Development, and Nutrition,* edited by J. von Braun and E. Kennedy. Baltimore: The Johns Hopkins University Press for the International Food Policy Research Institute.

Bryant, Coralie. ed. 1988. *Poverty, Policy, and Food Security in Southern Africa.* Boulder, CO: Lynne Rienner Publishers.

Bryceson, Deborah F. 1989. "Nutrition and the Commoditization of Food in Sub-Saharan Africa." *Social Science and Medicine.* 28(5):425-440.

Brydon, Lynne, and S. Chant. 1989. *Women in the Third World: Gender Issues in Rural and Urban Areas.* New Brunswick, NJ: Rutgers University Press.

Bujra, Janet. 1992. "Ethnicity and Class: The Case of the East African 'Asians'." Pp. 347-361 in *Poverty and Development in the 1990s*, edited by T. Allen and A. Thomas. Oxford: Oxford University Press and The Open University.

Campbell, Cathy C. 1991. "Food Insecurity: A Nutritional Outcome or a Predictor Variable?" *The Journal of Nutrition.* 121(3):408-415.

Campbell, David J. 1990. "Strategies for Coping with Severe Food Deficits in Rural Africa: A Review of the Literature." *Food and Foodways.* 4(2):143-162.

Campbell, David, L. M. Zinyama, and T. Matiza. 1991. "Coping with Food Deficits in Rural Zimbabwe: The Sequential Adoption of Sequential Strategies." *Research in Rural Sociology and Development.* 5:73-85.

Cassim, Fuad. 1988. "Growth, Crisis and Change in the South African Economy." Pp. 1-18 in *After Apartheid: Renewal of the South African Economy*, edited by J. Suckling and L. White. London: James Currey Ltd.

Chant, Sylvia. 1991. *Women and Survival in Mexican Cities: Perspectives on Gender, Labor Markets and Low-Income Households.* New York: Manchester University Press.

Chipika, Jessimen. 1994. *Poverty, Food Insecurity and the Child Malnutrition Problem in Rural Zimbabwe: The Case of Mashonaland West Province.* DPP Joint Working Paper No. 2. Development Policy and Practice Research Group, University of Zimbabwe/The Open University.

Coles, Catherine M. 1993. "Land Reform for Post-Apartheid South Africa." *Boston College Environmental Affairs Law Review.* Summer 1993, 20: 699-759.

Corbett, Jane. 1988. "Famine and Household Coping Strategies." *World Development.* 16(9): 1099-1112.

Crehan, Kate. 1992. "Rural Households: Making a Living." Pp. 87-112 in *Rural Livelihoods: Crises and Responses*, edited by H. Bernstein, B. Crow, and H. Johnson. Oxford: Oxford University Press and The Open University.

Crehan, Kate. 1992. "Rural Households: Survival and Change." Pp. 113-134 in *Rural Livelihoods: Crises and Responses*, edited by H. Bernstein, B. Crow, and H. Johnson. Oxford: Oxford University Press and The Open University.

Crow, Ben. 1992. "Understanding Hunger and Famine." Pp. 15-33 in *Poverty and Development in the 1990s*, edited by T. Allen and A.Thomas. Oxford: Oxford University Press and The Open University.

Davenport, T.R.H. 1991. *South Africa: A Modern History*. London: Macmillan Academic and Professional Ltd.

Davidson, Andrew P. 1991. "Rethinking Livelihood Strategies." *Research in Rural Sociology and Development*. 5:11-28.

Davies, Susanna. 1993. "Are Coping Strategies a Cop-Out?" *IDS Bulletin*. 24(4):60-72.

Delafin, Antoinette. 1995. "All the Lonely People." *Ceres: The FAO Review*. March/April 1995. 27(2):26-30.

Devereux, Stephen. 1993. "Goats Before Ploughs: Dilemmas of Household Response Sequencing During Food Shortages." *IDS Bulletin*. 24(4):52-59.

Dibley, Michael J., N. Staehling, P. Nieburg, and F. L. Trowbridge. 1987. "Interpretation of Z-score Anthropometric Indicators Derived from the International Growth Reference." *American Journal of Clinical Nutrition*. 46:749-762.

Dreze, Jean, and A. Sen. 1989. *Hunger and Public Action*. Oxford: Clarendon Press.

D'Souza, Frances, M. Mashanini, Z. Pongoma, and T. Mashanini. 1987. *First Report on Estimating Vulnerability in Black Rural Communities in South Africa*. Oxford: University of Oxford.

Ettling, M., D.A. McFarland, L.J. Schultz, and L. Chitsulo. 1994. "Economic Impact of Malaria on Malawian Households." *Tropical Medicine and Parasitology*. 45:74-79

Evans, Alison. 1991. "Gender Issues in Rural Household Economics." *IDS Bulletin*. 22(1):51-59.

Evans, Hugh E., and P. Ngau. 1991. "Rural-Urban Relations, Household Income Diversification and Agricultural Productivity." *Development and Change*. 22(3):519-545.

Evans, Peter, and J. D. Stephens. 1988. "Development and the World Economy." Pp. 739-773 in *Handbook of Sociology*, edited by N. Smelser. Newbury Park, CA: Sage Publications.

Fincham, R. et al. 1993. *Nutrition and Health in South Africa: The State of Nutrition and the Development of Nutrition Policy.* Cape Town: SALDRU.

Food and Agriculture Organization. 1994. *The State of Food and Agriculture.* Rome: Food and Agriculture Organization of the United Nations.

Food and Agriculture Organization. 1990. *Conducting Small-Scale Nutrition Surveys: A Field Manual.* Rome: Food and Agriculture Organization of the United Nations.

Food and Agriculture Organization. 1985. *Fifth World Food Survey.* Rome: Food and Agriculture Organization of the United Nations.

Foster, Phillips. 1992. *The World Food Problem: Tackling the Causes of Undernutrition in the Third World.* Boulder, CO: Lynne Rienner Publishers.

Francis, Elizabeth. 1995. "Migration and Changing Divisions of Labour: Gender Relations and Economic Change in Koguta, Western Kenya." *Africa.* 65(2):197-216.

Francis, Elizabeth, and J. Hoddinott. 1993. "Migration and Differentiation in Western Kenya: A Tale of Two Sub-Locations." *The Journal of Development Studies.* October 1993, 30(1):115-145.

Frankenberger, Timothy R. 1992. "Indicators and Data Collection Methods for Assessing Household Food Security." Pp. 73-134 in *Household Food Security: Concepts, Indicators, Measurements*, edited by S. Maxwell and T.R. Frankenberger. New York: United Nations Children Fund and International Fund for Agricultural Development.

Frankenberger, Timothy R., and D. M. Goldstein. 1990. "Food Security, Coping Strategies, and Environmental Degradation." *Arid Lands Newsletter.* Fall/Winter 1990. 30:21-27. Office of Arid Lands Studies. Tucson, AZ: The University of Arizona.

Geisler, Gisela. 1993. "Silences Speak Louder Than Claims: Gender, Household and Agricultural Development in Southern Africa." *World Development.* 21(12):1965-1980.

Gibson, Rosalind S. 1990. *Principles of Nutritional Assessment.* Oxford: Oxford University Press.

Giddens, Anthony. 1989. "A Reply to My Critics." Pp. 249-301 in *Social Theory of Modern Societies: Anthony Giddens and His Critics*, edited by D. Held and J.B. Thompson. Cambridge: Cambridge University Press.

Giddens, Anthony. 1984. *The Constitution of Society: Outline of the Theory of Structuration.* Cambridge: Polity Press.

Gisbert, M.E., M. Painter, and M. Quitón. 1994. "Gender Issues Associated with Labor Migration and Dependence on Off-Farm Income in Rural Bolivia." *Human Organization.* 53(2):110-122.

Gorstein, J., K. Sullivan, R. Yip, M. de Onís, F. Trowbridge, P. Fajans, and G. Clugston. 1994. "Issues in the Assessment of Nutritional Status Using Anthropometry" *Bulletin of the World Health Organization.* 72(2):273-283.

Grimm, Lawrence G. 1993. *Statistical Applications for the Behavioral Sciences.* New York: John Wiley and Sons, Inc.

Griffin, Keith. 1987. "World Hunger and World Economy." Pp. 17-46 in *Pursuing Food Security: Strategies and Obstacles in Africa, Asia, Latin America, and the Middle East,* edited by W. L. Hollist and F.L. Tullis. Boulder, CO: Lynne Rienner Publishers.

Gustafsson, Björn, and N. Makonnen. 1994. "The Importance of Remittances for the level and Distribution of Economic Well-being in Lesotho." *Journal of International Development.* 6(4): 373-397.

Guyer, Jane I. 1986. "Intra-Household Processes and Farming Systems Research: Perspectives from Anthropology." Pp. 92-104 in *Understanding Africa's Rural Households and Farming Systems,* edited by J.L. Moock. Boulder: Westview Press.

Gwanfogbe, Philomina Ndawoh. 1994. *Determinants of Food Status and Maternal Technology and Their Effects on the Growth of Recently Weaned Children in Rural West Province (Cameroon).* Unpublished Ph.D. Dissertation, Kansas State University.

Haddad, Lawrence. 1991. "Gender and Poverty in Ghana: A Descriptive Analysis of Selected Outcomes and Processes." *IDS Bulletin.* 22(1):5-16.

Haddad, Lawrence, C. Peña, A. Quisumbing, A. Slack, and C. Nishida. 1995. *Poverty and Nutrition Within Households: Review and New Evidence.* Washington, DC: International Food Policy Research Institute.

Heap, Marion, and M. Ramphele. 1991. "The Quest for Wholeness: Health Care Strategies Among the Residents of Council-Built Hostels in Cape Town." *Social Science and Medicine.* 32(2):117-126.

Hewitt, Tom, and I. Smyth. 1992. "Is The World Over-Populated?" Pp. 78-96 in *Poverty and Development in the 1990s*, edited by T. Allen and A. Thomas. Oxford: Oxford University Press and The Open University.

Hodgson, Jonathan M., B. Hsu-Hage, and M. L. Wahlqvist. 1994. "Food Variety as a Qualitative Descriptor of Food Intake." *Ecology of Food and Nutrition.* 32:137-148.

Hopkins, Raymond F. 1986. "Food Security, Policy Options and the Evolution of State Responsibility." Pp. 3-36 in *Food, the State, and International Political Economy: Dilemmas of Developing Countries*, edited by F. L. Tullis and W.L. Hollist. Lincoln: University of Nebraska Press.

House, William J. 1991. "The Nature and Determinants of Socio-economic Inequality among Peasant Households in Southern Sudan." *World Development.* 19(7):867-884.

Hussain, M.A. 1990. "Nutrition Policy and the Urban Poor in Developing Countries." *Food Policy.* June 1990. 15(3):186-192.

Huss-Ashmore, Rebecca, and J. J. Curry. 1994. "Diet, Nutrition and Agricultural Development in Swaziland. 3. Household Economics and Demography." *Ecology of Food and Nutrition.* 33:107-121.

Immink, Maarten D.C., and J. A Alarcon. 1991. "Household Food Security and Crop Diversification among Smallholders in the Highlands of Guatemala." *Ecology of Food and Nutrition.* 25:287-305.

Islam, M. Aminul, M. M. Rahman, and D. Mahalanabis. 1994. "Material and Socioeconomic Factors and the Risk of Severe Malnutrition in a Child: A Control Study." *European Journal of Clinical Nutrition.* 48:416-424.

Jonsson, Urban. 1988. "A Conceptual Approach to the Understanding and Explanation of Hunger and Malnutrition in Society." Pp. 20-42 in *Hunger and Society: Volume 1-An Understanding of the Causes*, edited by M.C. Latham, et al.. Cornell International Nutrition Monograph Series No.17. Ithaca: Cornell University.

Jöreskog, Karl G. and D. Sörbom. 1989. *LISREL 7: A Guide to the Program and Applications.* 2nd Edition. Chicago: SPSS, Inc.

Kaiser, Lucia L., and K. G. Dewey. 1991. "Household Economic Strategies, Food Resource Allocation, and Intrahousehold Patterns of Dietary Intake in Rural Mexico." *Ecology of Food and Nutrition.* 25:123-145.

Kaiser, Lucia L., and K. G. Dewey. 1991. "Household Economic Strategies and Food Expenditure Patterns in Rural Mexico: Impact on Nutritional Status of Pre-school Children." *Ecology of Food and Nutrition.* 25:147-168.

Katz, Elizabeth D. 1995. "Gender and Trade Within the Household: Observations from Rural Guatemala." *World Development.* 23(2):327-342.

Kennedy, Eileen. 1994. "Health and Nutrition Effects of Commercialization of Agriculture." Pp. 79-99 in *Agricultural Commercialization, Economic Development, and Nutrition*, edited by J. von Braun and E. Kennedy. Baltimore: The Johns Hopkins University Press for the International Food Policy Research Institute.

Kennedy, Eileen, and L. Haddad. 1994. "Are Pre-Schoolers from Female-Headed Households Less Malnourished? A Comparative Analysis of Results from Ghana and Kenya." *The Journal of Development Studies.* April 1994. 30(3):680-695.

Kennedy, Eileen, P. Peters, and L. Haddad. 1994. "Effects of Gender of Head on Women's and Children's Nutritional Status." Pp. 109-124 in *Nutrition in the Nineties: Policy Issues*, edited by M.R. Biswas and M. Gabr. New Delhi: Oxford University Press.

Kennedy, Eileen, and P. Peters. 1992. "Household Food Security and Child Nutrition: The Interaction of Income and Gender of Household Head." *World Development.* 20(8):1077-1085.

Kennedy, Eileen, and B. Rogers. 1992. "The Implications of Income and Household Structure on the Intra-Household Allocation of Resources in Kenya." *Understanding How Resources are Allocated Within Households.* IFPRI Policy Briefs No.8. Washington, DC.: International Food Policy Research Institute.

Kigutha, H.N., W. A. van Staveren, W. Veerman, and J.G.A.J. Hautvast. 1995. "Child Malnutrition in Poor Smallholder Households in Rural Kenya: An In-depth Situation Analysis." *European Journal of Clinical Nutrition.* 49:691-702.

Krebs-Smith, S.M., H. Smicklas-Wright, H. A. Guthrie, and J. Krebs-Smith. 1987. "The Effects of Variety - Food Choices on Dietary Quality." *Journal of the American Dietetic Association.* July 1987, 87(7):897-903.

Kumar, Krishna. 1989. *Indicators for Measuring Changes in Income, Food Availability and Consumption, and the Natural Resource Base.* AID Program Design and Evaluation Methodology No.12. September 1989. Washington, D.C.: U.S. Agency for International Development.

Lemon, Anthony. 1987. *Apartheid in Transition.* Hants, England: Gower Publishing Company Limited.

Leonard, William R. 1991. "Household-Level Strategies for Protecting Children from Seasonal Food Scarcity." *Social Science and Medicine.* 33(10):1127-1133.

Leonard, William R., K. M. DeWalt, J. E. Uquillas, and B. R. DeWalt. 1994. "Distribution and Nutritional Status among Cassava Producing Agriculturalists of Coastal Ecuador." *Ecology of Food and Nutrition.* 32: 113-127.

Letsoalo, Essy M. 1987. *Land Reform in South Africa.* Johannesburg: Skotaville Publishers.

Loewenson, Rene. 1988. "Labour Insecurity and Health: An Epidemiological Study in Zimbabwe" *Social Science and Medicine.* 27(7):733-741.

Longhurst, Richard. 1988. "Cash Crops and Household Food Security and Nutrition." *IDS Bulletin.* 19(2):28-36.

Longhurst, Richard. 1986. "Household Food Strategies in Response to Seasonality and Famine." *IDS Bulletin.* 17(3):27-35.

Lundahl, Mats, and L. Moritz. 1993. "Macro-Economic Stagnation and Structural Weaknesses in the South African Economy." Pp. 322-343 in *Economic Crisis in Africa: Perspectives in Policy Responses*, edited by M. Blomström and M. Lundahl. London: Routledge.

Mabin, Alan. 1992. "Dispossession, Exploitation and Struggle: An Historical Overview of South African Urbanization." Pp. 13-24 in *The Apartheid City and Beyond: Urbanization and Social Change in South Africa*, edited by David Smith. London: Routledge.

Marcus, Tessa. 1989. *Modernising Super-Exploitation: Restructuring South African Agriculture.* London: Zed Books, Ltd.

Martin, William G. 1990. "From NIC to NUC: South Africa's Semi-Peripheral Regimes." Pp. 203-223 in *Semi-Peripheral States in the World Economy*, edited by W.G. Martin. New York: Greenwood Press.

Martin, William G. and M. Beittel. 1987. "The Hidden Abode of Reproduction: Conceptualizing Households in Southern Africa." *Development and Change.* 18(2):215-234.

Maxwell, Simon, and M. Smith. 1992. "Household Food Security: A Conceptual Review." Pp.1-72 in *Household Food Security: Concepts, Indicators, Measurements*, edited by S. Maxwell and T.R. Frankenberger. New York: United Nations Children Fund and International Fund for Agricultural Development.

May, Julian. 1990. "The Migrant Labor System: Changing Dynamics in Rural Survival." Pp. 175-186 in *The Political Economy of South Africa*, edited by N. Nattrass and E. Ardington. Cape Town: Oxford University Press.

May, Julian, and S. Rankin. 1991. "The Differentiation of the Urbanization Process Under Apartheid." *World Development.* 19(10):1351-1365.

Mazonde, Isaac. 1995. "Food Security and the Household Labor: Social Transformation in a Botswana Village." *Journal of Contemporary African Studies.* 13(1):75-89.

Mazur, Robert E. 1994. Implications for Land Reform of Demographic and Socio-economic Profiles in the Western Cape: Analysis of Data from the *Program for Statistics on Living Standards and Development.* For the Western Cape Regional Overview of the South African National Land Reform Preparation Programme. Johannesburg: Land and Agricultural Policy Centre, and Stellenbosch: Centre for Rural Legal Studies.

Mazur, Robert E. 1991. "Rural Household Strategies in Mali and Zimbabwe: Labor Allocation and Migration." *Research in Rural Sociology and Development.* 5:87-111.

Mazur, Robert E., and D. Sanders. 1987. "Socioeconomic Factors Associated with Child Health and Nutrition in Peri-Urban Zimbabwe." *Ecology of Food and Nutrition.* 22:19-34.

Mbago, Maurice C.Y., and P. P. Namfua. 1992. "Some Determinants of Nutritional Status of One-to-Four-Year-Old Children in Low Income Urban Areas in Tanzania." *Journal of Tropical Pediatrics.* December 1992. 38:299-306.

Mkandawire, Richard. 1993. "Agrarian Change and Food Security Among Smallholder Farmers in Malawi." Pp. 63-84 in *Food Policy and Agriculture in Southern Africa*, edited by R. Mkandawire and K. Matlosa. Harare: Sapes Books.

Mouzelis, Nicos. 1989. "Restructuring Structuration Theory." *The Sociological Review.* November 1989. 37(4):613-635.

Mukonoweshuro, Eliphas G. 1991. "Between Verwoerd and the ANC: Profiles of Contemporary Repression, Deprivation, and Poverty in South Africa's 'Bantustans'." *Social Justice.* Spring-Summer, 18(1-2):171-185.

Murray, Colin. 1987. "Class, Gender and the Household: The Developmental Cycle in Southern Africa." *Development and Change.* 18:234-249

Muthwa, Sibongile. 1994. "Female Household Headship and Household Survival in Soweto." *Journal of Gender Studies.* 3(2):165-175.

National Land Committee. 1996. "Tenure Reform: Land Reform's Third Pillar." *Land Update*. August 1996. 50:1-19.

National Land Committee. 1996. "Rural Women: Reform Has Not Yet Landed." *Land Update*. April 1996. 46:1-19.

National Land Committee. 1996. "The Land Reform Green Paper: Varied Responses." *Land Update*. March 1996. 45:1-19.

National Research Council (U.S.). Subcommittee on the 10th edition of the RDAs. 1989. *Recommended Dietary Allowances, 10th Edition*. Washington. D.C.: National Academy Press.

Nattrass, Nicoli Jean. 1987. "Street Trading in Transkei – A Struggle Against Poverty, Persecution, and Prosecution." *World Development*. 15(7):861-875.

Nunnally, J.C. 1978. Psychometric Theory. New York: McGraw Hill.

O'Brien-Place, Patricia, and T. R. Frankenberger. 1988. *Food Availability and Consumption Indicators*. Nutrition in Agriculture Cooperative Agreement Report No.3. Tucson, AZ: University of Arizona, Office of Arid Lands Studies.

Onyango, Adelheid, K. Tucker, and T. Eisemon. 1994. "Household Headship and Child Nutrition: A Case Study in Western Kenya." *Social Science and Medicine*. 39(12):1633-1639.

Parker, Robert L. 1986. "Health Care Expenditures in a Rural Indian Community." *Social Science and Medicine*. 22(1):23-27.

Payne, P.R. 1990. "Measuring Malnutrition." *IDS Bulletin*. July 1990. 21(3):14-30.

Pelto, Gretel et al. 1991. "Household Size, Food Intake, and Anthropometric Status of School-Age Children in a Highland Mexican Area." *Social Science and Medicine*. 33(10):1135-1140.

Peters, Pauline E., and M. G. Herrera. 1994. "Tobacco Cultivation, Food Production and Nutrition among Small-holders in Malawi." Pp.309-327 in *Agricultural Commercialization, Economic Development and Nutrition*, edited by J. von Braun, and E. Kennedy. Baltimore: The Johns Hopkins University Press for the International Food Policy Research Institute.

Peters, Pauline E. 1986. "Household Management in Botswana: Cattle, Crops, and Wage Labor." Pp.133-154 in *Understanding Africa's Rural Households and Farming Systems*, edited by J.L.Moock. Boulder: Westview Press.

Pinstrup-Andersen, Per, S. Burger, J-P. Habicht, and K. Peterson. 1993. "Protein-Energy Malnutrition." Pp. 391-420 in *Disease Control Priorities in Developing Countries*, edited by D.T. Jamison et al. Oxford: Oxford University Press.

Popkin, Barry M., and E. Z. Bizgrove. 1988. "Urbanization and Nutrition in Low-Income Countries." *Food and Nutrition Bulletin.* 10(1):3-23.

Pryer, Jane, and N. Crook. 1988. *Cities of Hunger: Urban Malnutrition in Developing Countries*. Oxford: OXFAM.

Quisumbing, Agnes, L. R. Brown, H. S. Feldstein, L. Haddad, L., and C. Peña. 1995. *Women: The Key to Food Security*. IFPRI Food Policy Report. August 1995. Washington, DC.: International Food Policy Research Institute.

Reardon, Thomas, P. Matlon, and C. Delgado. 1988. "Coping with Household -level Food Insecurity in Drought-affected Areas of Burkina Faso." *World Development.* 16(9):1065-1074.

Rodgers, Gerry. 1989. "Introduction: Trends in Urban Poverty and Labour Market Access." Pp. 1-33 in *Urban Poverty and the Labour Market: Access to Jobs and Incomes in Asian and Latin American Cities*, edited by G. Rodgers. Geneva: International Labour Office.

Rogers, Beatrice Lorge. 1996. "The Implications of Female Household Headship for Food Consumption and Nutritional Status in the Dominican Republic." *World Development.* 24(1): 113-128.

Safa, Helen I. and P. Antrobus. 1992. "Women and the Economic Crisis in the Caribbean." Pp. 49-82 in *Unequal Burden: Economic Crisis, Persistent Poverty, and Women's Work*, edited by L. Beneria and S. Feldman. Boulder: Westview Press.

Sahn, David E. 1994. "The Contribution of Income to Improved Nutrition in Côte d'Ivoire." *Journal of African Economies.* 3(1):29-61.

Sauerborn, R., et al. 1995. "The Economic Costs of Illness for Rural Households in Burkina Faso." *Tropical Medicine and Parasitology.* 46(1):54-60.

Seidman, Gay. 1993. "'No Freedom Without the Women': Mobilization and Gender in South Africa, 1970-1992." *Signs.* Winter 1993. 18(2):291-320.

Sen, Amartya. 1993. "The Causation and Prevention of Famines: A Reply." *The Journal of Peasant Studies*. 21(1):29-40.

Sen, Amartya. 1990. "Food, Economics, and Entitlements." Pp. 34-52 in *The Political Economy of Hunger: Volume l - Entitlement and Well-being*, edited by J. Dreze and A. Sen. Oxford: Clarendon Press.

Sen, Amartya. 1981. *Poverty and Famines: An Essay on Entitlement and Deprivation.* Oxford: Clarendon Press.

Senauer, Benjamin, and M. Garcia. 1991. "Determinants of the Nutrition and Health Status of Pre-school Children: An Analysis with Longitudinal Data." *Economic Development and Cultural Change*. January 1991. 39(2):371-389.

Shack, Kathryn, L. E. Grivetti, and K. G. Dewey. 1990. "Cash Cropping, Subsistence Agriculture, and Nutritional Status among Mothers and Children in Lowland Papua New Guinea." *Social Science and Medicine*. 31(1):61-68.

Sharp, John, and A. Spiegel. 1990. "Women and Wages: Gender and the Control of Income in Farm and Bantustan Households." *Journal of Southern African Studies*. September 1990. 16(3):527-549.

Shimbo, Shinichiro et al. 1994. "Number of Food Items as an Indicator of Nutrient Intake." *Ecology of Food and Nutrition*. 32:197-206.

Siqwana-Ndulo, Nombulelo. 1993. *Rural African Family Structure in the Transkei, South Africa.* Unpublished Ph.D. Dissertation, University of California-Los Angeles.

Smith, Marisol, J. Pointing, and S. Maxwell. 1992. "Household Food Security: Concepts and Definitions - An Annotated Bibliography." Pp. 135-191 in *Household Food Security: Concepts, Indicators, Measurements*, edited by S. Maxwell and T.R. Frankenberger. New York: United Nations Children Fund and International Fund for Agricultural Development.

Strauss, John. 1990. "Households, Communities, and Preschool Children's Nutrition Outcomes: Evidences from Rural Côte d'Ivoire." *Economic Development and Cultural Change*. 38(2):231-261.

"South Africa". 1995. *The Economist*. 20 May 1995, pp. 3-26.

Southern Africa Labour and Development Research Unit (SALDRU). 1994. *South Africans Rich and Poor: Baseline Household Statistics*. Project for Statistics on Living Standards and Development. Cape Town: SALDRU. August 1994.

Spiegel, Andrew, V. Watson, and P. Wilkinson. 1995. *Domestic Diversity and Fluidity among Some African Households in Greater Cape Town.* Cape Town: University of Cape Town

Spiegel, Andrew, V. Watson, and P. Wilkinson. 1994. *Domestic Fluidity and Movement Patterns among Cape Town's African Population: Some Implications for Housing Policy.* Cape Town: Centre for African Studies, University of Cape Town.

Staatz, J.M., V. C. D'Agostino, and S. Sundberg. 1990. "Measuring Food Security in Africa: Conceptual, Empirical, and Policy Issues." *American Journal of Agricultural Economics.* December 1990. 7(2):1311-1317.

Strauss, John. 1990. "Households, Communities, and Preschool Children's Nutrition Outcomes: Evidence from Rural Cote d'Ivoire" *Economic Development and Cultural Change.* 38(2):231-261.

Sullivan, Kevin, J. Gorstein, and D. Coulombier. 1994. "Programs for Nutritional Anthropometry" *EpiInfo Version 6 Manual.* Stone Mountain, GA: Center for Disease Control.

Swift, Jeremy. 1993. "Understanding and Preventing Famine and Famine Mortality." *IDS Bulletin.* 24(4):1-16.

Swift, Jeremy. 1989. "Why are Rural People Vulnerable to Famine?" *IDS Bulletin.* 20(2):8-15.

Tabatabai, Hamid. 1995. "More Jobs Mean More Meals." *Ceres: The FAO Review.* March/April 1995. 27(2):34-37.

Tabibzadeh, I., A. Rossi-Espagnet, and R. Maxwell. 1989. *Spotlight on the Cities: Improving Urban Health in Developing Countries.* Geneva: World Health Organization.

Thomas, R.B., and T. L. Leatherman. 1990. "Household Coping Strategies and Contradictions in Response to Seasonal Food Shortage." *European Journal of Clinical Nutrition.* 44 (Suppl. 1): 103-111.

Thomas, R. Brooke, S. Paine, and B. P. Brenton. 1989. "Perspectives on Socio-Economic Causes of and Responses to Food Deprivation." *Food and Nutrition Bulletin.* 11(1):41-54.

Thompson, Carol B. 1991. *Harvests Under Fire: Regional Cooperation for Food Security in Southern Africa.* London: Zed Books, Ltd.

Trairatvorakul, Prasarn. 1984. *The Effects on Income Distribution and Nutrition of Alternative Rice Price Policies in Thailand.* IFPRI Research Report No.46. Washington, DC: International Food Policy Research Institute.

Tschirley, David L., and M. T. Weber. 1994. "Food Security Strategies Under Extremely Adverse Conditions: The Determinants of Household Income and Consumption in Rural Mozambique." *World Development.* 22(2):159-173.

United Nations' Children's Fund. 1996. *Children, Poverty, and Disparity Reduction: Towards Fulfilling the Rights of South Africa's Children.* A Report Commissioned by the Reconstruction and Development Programme. May 1996.

United Nations' Children's Fund. 1993. *Children and Women in South Africa: A Situation Analysis.* Johannesburg: UNICEF and the National Children's Rights Committee. June 1993.

van Rensburg, H.C.J., A. Fourie, and E. Pretorius. undated. *Health Care in South Africa.* Academica, pp. 125-138.

Vella, Venanzio et.al. 1995. "Determinants of Nutritional Status in Southwest Uganda." *Journal of Tropical Pediatrics.* April 1995. 41:89-98.

Vickers, Jeanne. 1991. *Women and the World Economic Crisis.* New Jersey: Zed Books Ltd.

Vogt, W. Paul. 1993. *Dictionary of Statistics and Methodology: A Non-technical Guide for the Social Sciences.* Newbury Park, CA: Sage Publications.

von Bach, Sartorius HJ. 1994. *A Poverty Profile of the Rural Areas and Its Gap to Poverty.* Unpublished paper. Pretoria: University of Pretoria, pp.1-20.

von Braun, Joachim. 1994. "Production, Employment, and Income Effects of Commercialization of Agriculture." Pp. 37-64 in *Agricultural Commercialization, Economic Development, and Nutrition*, edited by J. von Braun and E. Kennedy. Baltimore: The Johns Hopkins University Press for the International Food Policy Research Institute.

von Braun, Joachim, and M. D. C. Immink. 1994. "NontraditionalVegetable Crops and Food Security among Smallholder Farmers in Guatemala." Pp. 189-203 in *Agricultural Commercialization, Economic Development, and Nutrition*, edited by J. von Braun and E. Kennedy. Baltimore: The Johns Hopkins University Press for the International Food Policy Research Institute.

von Braun, Joachim, J. McComb, B. K. Fred-Mensah, and R. Pandya-Lorch. 1993. *Urban Food Insecurity and Malnutrition in Developing Countries*. Washington, DC: International Food Policy Research Institute.

von Braun, Joachim, H. Bouis, S. Kumar, and R. Pandya-Lorch. 1992. *Improving Food Security of the Poor: Concept, Policy, and Programs*. Washington, DC: International Food Policy Research Institute.

von Braun, Joachim, and R. Pandya-Lorch. 1992. *Income Sources and Diversification Strategies of the Malnourished Rural Poor*. IFPRI Reprint No. 250. Washington, DC: International Food Policy Research Institute.

Wallerstein, Immanuel, and J. Smith. 1992. "Households as an Institution of the World Economy." Pp. 3-23 in *Creating and Transforming Households: The Constraints of the World Economy*, edited by J. Smith et al. Cambridge: Maison des Sciences de l'Homme and Cambridge University Press.

Walker, Peter. 1995. "Indigenous Knowledge and Famine Relief in the Horn of Africa." Pp. 147-154 in *The Cultural Dimension of Development: Indigenous Knowledge Systems*, edited by D.M. Warren, J.L. Slikkerveer, and D. Brokensha. London: Intermediate Technology Publications.

Weiner, Daniel. 1990. "The Land Question in South Africa." Pp. 293-307 in *Agrarian Reform and Grassroots Development: Ten Case Studies*, edited by Roy Prosterman et al. Boulder, CO: Lynne Rienner Publishers.

Wilson, Francis, and M. Ramphele. 1989. *Uprooting Poverty: The South African Challenge*. (Report for the Second Carnegie Inquiry into Poverty and Development in South Africa). London: W.W. Norton & Company.

Wisner, Ben. 1989. "Commodity Relations and Nutrition under Apartheid: A Note on South Africa." *Social Science and Medicine*. 23(5):441-446.

Wong, Rebecca, and R. E. Levine. 1992. "The Effect of Household Structure on Women's Economic Activity and Fertility: Evidence from Recent Mothers in Urban Mexico." *Economic Development and Cultural Change*. 41(1):89-102.

Woodhouse, Philip. 1992. "Social and Environmental Change in Sub-Saharan Africa." Pp.165-194 in *Rural Livelihoods: Crises and Responses*, edited by H. Bernstein, B. Crow, and H. Johnson. Oxford: Oxford University Press and The Open University.

World Bank. 1995. *World Development Report 1995*. Oxford: Oxford University Press for the World Bank.

World Bank. 1993. *World Tables 1993*. London: The Johns Hopkins University Press.

World Bank. 1986. *Poverty and Hunger: Issues and Options for Food Security in Developing Countries*. Washington, D. C.: International Bank for Reconstruction and Development/World Bank.

World Health Organization. 1983. *Measuring Change in Nutritional Status: Guidelines for Assessing the Nutritional Impact of Supplementary Feeding Programmes for Vulnerable Groups*. Geneva: World Health Organization.

Young, Helen. 1992. *Food Security and Famine: Assessment and Response*. OXFAM Practical Health Guide No.7. Oxford: OXFAM.

Zaidi, S. Akbar. 1988. "Poverty and Disease: Need for a Structural Change." *Social Science and Medicine*. 27(2):119-127.